U.S. Department
of Transportation

**Federal Aviation
Administration**

Annual Report on the Effect of the Airline Deregulation Act on the Level of Air Safety

Washington, D.C. 20591

July 1988

Report of
the Secretary of Transportation
to the United States Congress
pursuant to Section 107 of the
Airline Deregulation Act of
1978 (P.L. 95-504)

THE SECRETARY OF TRANSPORTATION

WASHINGTON, D.C. 20590

October 7, 1988

The Honorable George Bush
President of the Senate
Washington, DC 20510

Dear Mr. President:

I am pleased to transmit the enclosed report, "The Effect of Airline Deregulation on the Level of Air Safety." This report was prepared in response to the requirement of Section 107 of the Airline Deregulation Act of 1978 (P.L. 95-504); this is the ninth such report transmitted to Congress. The report reviews the impact of deregulation on commercial aviation operations in 1987; provides data on commercial aviation accidents, incidents, and enforcement actions; and reviews staffing requirements and the adequacy of air safety regulations.

The major findings of the report are summarized below:

o The number of flights in 1987 increased for almost all segments of commercial aviation, setting a new high.

o While air traffic continued to increase, accident and fatality rates for Part 121 air carriers in scheduled service have continued their long-term trend of levels below pre-deregulation years. A total of five Part 121 accidents occurred during 1987.

o Total accident and fatality rates for commuter carriers are much lower than those recorded for 1978, the last year of airline regulation. However, the rates for commuter air carriers for 1987 represent a statistical high point since 1981. The accident rate for air taxis, on the other hand, was the lowest since deregulation.

o Due to the increasing number of passengers and air carriers in the system, we expect to add up to 1,000 safety inspectors to the Federal Aviation Administration (FAA) workforce over the next four fiscal years. Adjustments will be made within the normal budgetary process.

o As in past years, the FAA's primary emphasis remained on safety in 1987. The FAA Administrator initiated "Impact '88," which includes the development of a system-wide safety index. This will enable the FAA to identify potential trouble spots within the National Airspace System and correct any shortcomings; the Safety Activity Functional Evaluation (SAFE) and National Aviation Safety Inspection Program play integral roles in this effort.

In short, the deregulated airline industry has not only been a boon to consumers, but is operating more safely than the industry did under heavy regulation. The FAA has been and will continue to monitor safety within the industry; to date, there is absolutely no evidence that deregulation has hurt air safety in any way. In fact, given the long-term statistical trend, it would appear that deregulation has enhanced safety.

A copy of this report also has been sent to the Speaker of the House of Representatives.

Sincerely,

Jim Burnley

Enclosure

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WASHINGTON, D.C. 20590

October 7, 1988

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Speaker of the House of
Representatives
Washington, DC 20515

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EXECUTIVE SUMMARY

This report for calendar year 1987 is being submitted to Congress in response to the requirements of Sections 107(b) and (c) of the Airline Deregulation Act of 1978. This section of the Act requires an analysis of the effects of deregulation in the preceding calendar year in terms of accidents, incidents and violations filed, current and anticipated staffing requirements, changes in air carrier operating practices and procedures, and the adequacy of air safety regulations.

Recommendations are also required for the levels of surveillance and levels of staffing necessary to perform this surveillance.

GENERAL IMPACT OF THE ACT

1. Part 121 air carriers have shown increases in all categories of activity with significant growth over the last several years.

2. Part 135 commuter air carrier activity is higher in all categories compared to 1978 levels.

3. Part 135 commuter air carriers and Part 121 scheduled air carriers continue to realign their route systems. The net result has been increased stage lengths for Part 121 scheduled air carriers and slightly shorter stage lengths for Part 135 commuter air carriers.

EFFECT OF THE ACT ON AIR SAFETY

1. The accident rate of Part 121 air carriers in scheduled service is lower than the 1978 level. Of the 31 accidents in this class of service, 4 were fatal accidents accounting for 231 fatalities. The total accident rate is slightly lower than the 1978 level while the fatal accident rate is more than 60 percent lower than the rate recorded ten years ago. The December 7 crash of Pacific Southwest Airlines flight killing all 43 aboard in which sabotage is suspected to be the cause of the accident, is excluded from the accident and fatality rate calculations.

2. Five accidents occurred in 1987 for Part 121 air carriers in non-scheduled service. One of the accidents was fatal resulting in a lone fatality.

3. After posting record safety levels in 1986, the accident and fatal accident rates of commuter air carriers jumped to their highest levels since 1981. These rates are still significantly lower than the 1978 rates.

4. The total accident rate for air taxis is a record low for the past ten years since deregulation. The fatal accident and fatality rates are much lower than the 1978 levels.

RECOMMENDATIONS FOR LEVELS OF SURVEILLANCE AND STAFFING

1. Based on a Job Task Analysis (JTA) performed as part of the Safety Activity Functional Evaluation (Project SAFE), inspector staffing and support personnel levels will be increased by 1,452 positions over the four fiscal years, 1988 through 1991. Congress has, however, authorized FAA an advance of 72 positions for fiscal year 1987, thereby reducing the level of recommended additions to 1,380 positions for the above fiscal years. The FAA will make every effort to assure that inspector levels remain consistent with anticipated workload requirements.

2. Continue to implement the Project SAFE recommendations which addressed the need for additional inspector staffing, inspector qualifications, training requirements, and inspector task and work functions.

3. Continue to implement the recommendations resulting from the National Aviation Safety Inspection Program (NASIP) which included special inspections of airlines operating under military charter and other air agency certificate holders such as repair stations and selected air carriers.

AIR CARRIER OPERATING PROCEDURES AND AIR SAFETY REGULATIONS

1. The major emphasis in 1988 will be to proceed with an agency-wide concerted effort in meeting objectives for those priority areas identified by IMPACT 88 along with further implementation of national programs in accordance with Project SAFE. These programs as well as new procedures and regulations will ensure that the FAA will continue to keep pace with the rapidly changing aviation industry and provide a safe and efficient air transportation system.

2. There are eight individual rulemaking actions, plans, and programs underway that could impact the operators in 1988. See Section 5.3 for further information pertinent to these eight actions. In addition, there were six FAA regulations, advisories, and orders issued in 1987 which are further explained in Section 5.2.

1.0 THE REPORT

1.1 PURPOSE

This report for calendar year 1987 is submitted to Congress in response to Sections 107(b) and 107(c) of the Airline Deregulation Act of 1978 (P.L. 95-504) to meet the Act's requirement for calendar year 1987. These sections require the submission of an annual report on the extent to which implementation of the Act has affected the level of air safety in the preceding calendar year and the submission of recommendations for levels of surveillance and staffing for the following year.

1.2 ANALYSIS REQUIRED

1. The Act requires that this report contain, at a minimum, an analysis of:

   a. All relevant data on accidents and incidents occurring in the preceding calendar year in air transportation and on violations of safety regulations issued by the Secretary of Transportation occurring during such year (107(b)(1)).

      This analysis is provided in Chapter 3.0.

   b. Current and anticipated personnel requirements of the FAA Administrator with respect to enforcement of air safety regulations (107(b)(2)).

      This analysis is provided in Chapter 4.0.

   c. Effects on current levels of air safety of changes or proposals for changes in air carrier operating practices and procedures which occurred during the calendar year covered by this report (107(b)(3)).

      This analysis is provided in Chapter 5.0.

   d. The adequacy of air safety regulations, taking into consideration changes in air carrier operating practices and procedures which occurred during the calendar year covered by this report (107(b)(4)).

      This analysis is provided in Chapter 5.0.

2. Section 107(c) of the Act also requires, on an annual basis, recommendations with respect to the:

a. Level of surveillance necessary to enforce air safety regulations (107(c)).

b. Level of staffing necessary to carry out such surveillance (107(c)).

The recommendations are included in Chapter 4.0.

1.3 ASSUMPTIONS MADE IN THIS REPORT

The following assumptions were made in order to provide a basis for the statistical comparison and findings contained in this report.

1. The level of air safety attained in calendar year 1978, the year the Act became law, is used as the standard for comparison and evaluation of the safety statistics for calendar years 1979 through 1987. Section 107(a) of the Act states that Congress intends that the implementation of the Act shall result in no diminution of the high standard of safety in air transportation attained in the United States at the time of enactment of the Act.

2. Any adverse effects of deregulation would be manifest among the air carriers engaged in extensive passenger service in the contiguous United States. The carriers which fall in this category are the air carrier, commuter, and air taxi operators. These operators have the most opportunities, that is, markets, resources, etc., to expand under the new economic options provided by the Act.

3. The level of safety existing in the system can be quantified by objective measures such as accidents, incidents, and violations. These measures represent the combined effects of FAA regulations, inspections and enforcement activities, air traffic control, safety educational programs, and operator practices.

4. The primary consideration of the Act's policy regarding air safety is the maintenance of a high level of safety for the traveling public. Based on this assumption and because the overwhelming majority of passengers are carried by air carrier, air taxi, and commuter operators, special emphasis is not given to other types of operators.

1.4 ASSOCIATED GOVERNMENT AGENCIES

The Government agencies referenced in this report and their responsibilities with respect to air safety are:

1. Department of Transportation (DOT) - An executive department of the U.S. Government established by the Department of Transportation Act of 1966 (80 Stat. 931) for the purpose of the provision of fast, safe, efficient, and convenient transportation at the lowest cost consistent therewith.

2. Federal Aviation Administration (FAA) - A part of the Department of Transportation, the FAA is charged with: regulating air commerce to promote its safety and development; achieving the efficient use of the navigable airspace of the United States; promoting, encouraging, and developing civil aviation; developing and operating a common system of air traffic control and air navigation for both civilian and military aircraft; and promoting the development of a national system of airports.

3. Research and Special Programs Administration (RSPA) - The Civil Aeronautics Board Sunset Act of 1984 (P.L 98-443) required air carriers to continue filing recurrent reports with DOT in accordance with the CAB rules in place at sunset. This Act also required DOT to collect certain aviation information and transferred CAB rules to DOT. RSPA is contining the former CAB activities of collecting and disseminating economic data on air transportation. RSPA is an information center for financial and traffic facts and statistics on the results of air carrier operations. These activities are required to provide consistent, comprehensive aviation information for program use by DOT, and use by other Federal agencies and public interest concerns.

4. National Transportation Safety Board (NTSB) - An autonomous agency, established as such in 1975 by the Independent Safety Board Act. The Board seeks to promote transportation safety by conducting independent accident investigations and making safety improvement recommendations to Government agencies, the transportation industry, and others on safety measures and practices.

1.5 DEFINITION OF TERMS

For the purpose of this report, the following definitions will apply:

1. Operator - A person holding a certificate authorizing the transportation of passengers and/or cargo for compensation or hire.

2. Part 121 Air Carriers - Any person who undertakes, whether directly or indirectly, to engage in air transportation under the rules contained in Part 121 of 14 CFR. Such operations would characteristically be conducted with aircraft having a maximum seating capacity of more than 30 seats or a payload capacity of more than 7,500 pounds.

3. Part 135 Air Taxi - Any person who conducts passenger-carrying operations under the rules contained in Part 135 of 14 CFR (and thus would operate aircraft having a maximum passenger seating capacity of 30 seats or less and a maximum payload capacity of 7,500 pounds or less).

4. Part 135 Commuter - Any person who conducts scheduled passenger carrying operations with a frequency of at least 5 round trips per week under the rules contained in Part 135 of 14 CFR (and thus would operate aircraft having a maximum passenger seating capacity of 30 seats or less and a maximum payload capacity of 7,500 pounds or less).

5. Aircraft Accident - An "aircraft accident" is defined by the NTSB as "an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until all such persons have disembarked, and in which any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached thereto, or in which the aircraft receives substantial damage."

6. Aircraft Incident - An "aircraft incident" is defined by the FAA as "an aircraft occurrence, not classified as an accident, in which a hazard or potential hazard to safety is involved." It is important to note that many of the incidents have no identifiable operational factors involved, but are found in routine maintenance and airworthiness inspections. Most incident information is forwarded by the operator to the FAA for analysis; however, the NTSB does specify certain types of incidents that must also be reported to them.

7. Violation - For the purpose of this report, a violation is "an official report filed by an FAA Aviation Safety Inspector, which alleges that an operator or an individual has failed to comply with one or more requirements of the air safety regulations."

8. Enforcement Case - An enforcement case represents an action taken by the FAA as the result of one or more violations.

1.6 SOURCES OF DATA

1. Exposure Information - Activity measures, such as flight hours, departures, miles flown, and number of passengers for Part 121 air carriers and commuters, were taken from data formerly reported to the CAB and now reported to the DOT's Research and Special Programs Administration (RSPA). On-demand air taxi flight hours are based on an annual FAA survey.

2. Accident Information - Accident information was taken from NTSB Safety Information Bulletin dated January 12, 1988. These data are preliminary.

3. Incident and Violation Information - The number of incidents and enforcement cases filed are obtained from FAA records. Incident information is as of January 13, 1988. Violation information is as of January 22, 1988. These data are preliminary.

4. Inspector Levels - The numbers of actual, authorized and proposed inspector and support personnel are taken from FAA records.

2.0 COMMERCIAL AVIATION OPERATING ENVIRONMENT

2.1 INTRODUCTION

The Airline Deregulation Act gives air carriers certain operational and economic options that were previously controlled by the Civil Aeronautics Board (CAB). Air carriers now have greater freedom to obtain operating authority, to acquire new routes, to modify existing routes, and to establish passenger fares. This greater freedom has stimulated competition among air carriers and has resulted in substantial changes in the commercial aviation operating environment. These changes have benefited the consumers at both major hubs and spokes. Air travel is now more available to that segment of the population not reached by the larger operators serving major hubs. These changes have also prompted the development and manufacture of more commuter-sized aircraft in order to reach these new markets.

Various statistical parameters are reviewed in this chapter to determine the effects of deregulation on the air carrier operating environment. These effects cannot be clearly distinguished from other overlying trends such as overall economic performance and the 1981 air traffic controllers strike.

2.2 FAR PART 121 AIR CARRIER OPERATING ENVIRONMENT

2.2.1 Scheduled Service

Since 1978, Part 121 carriers providing scheduled service have shown increases in all categories of activity. As shown in Figure 2-1, revenue passenger enplanements have increased from about 275 million in 1978 to a record high of 453 million in 1987, an increase of 65%. Aircraft miles flown and departures have increased by 54% and 39%, respectively (Figures 2-2 and 2-3). The larger increases in miles flown and passenger enplanements relative to departures reflect the longer stage lengths, larger aircraft, and a higher number of revenue passengers carried per departure for Part 121 carriers in scheduled service. The average stage length for these carriers has increased 11% from 502 miles in 1978 to 556 miles in 1987 (Figure 2-4). Although average stage length decreased from 579 miles to 556 miles from 1986 to 1987, the trend in average stage length has increased since 1978. Deregulation has contributed to the concentration of these carriers in the high density, medium- and long-haul markets. Aircraft flight hours have followed the same general trend as aircraft miles flown, increasing by 61% from 6.0 million in 1978 to 9.7 million in 1987 (Figure 2-5).

FIGURE 2-1
REVENUE PASSENGER ENPLANEMENTS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Scheduled Service
1978 - 1987

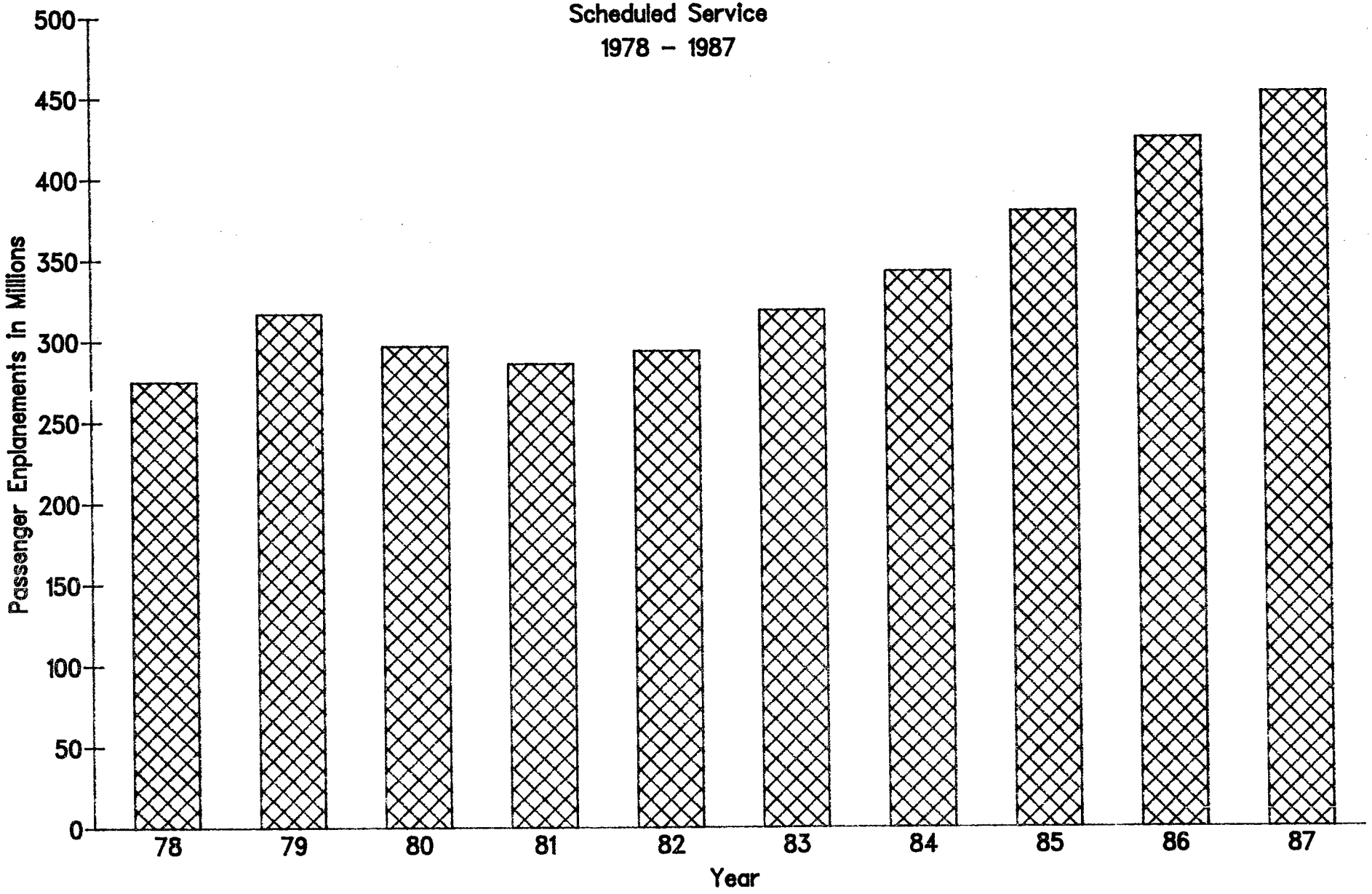


FIGURE 2-2
AIRCRAFT MILES FLOWN
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Scheduled Service
1978 - 1987

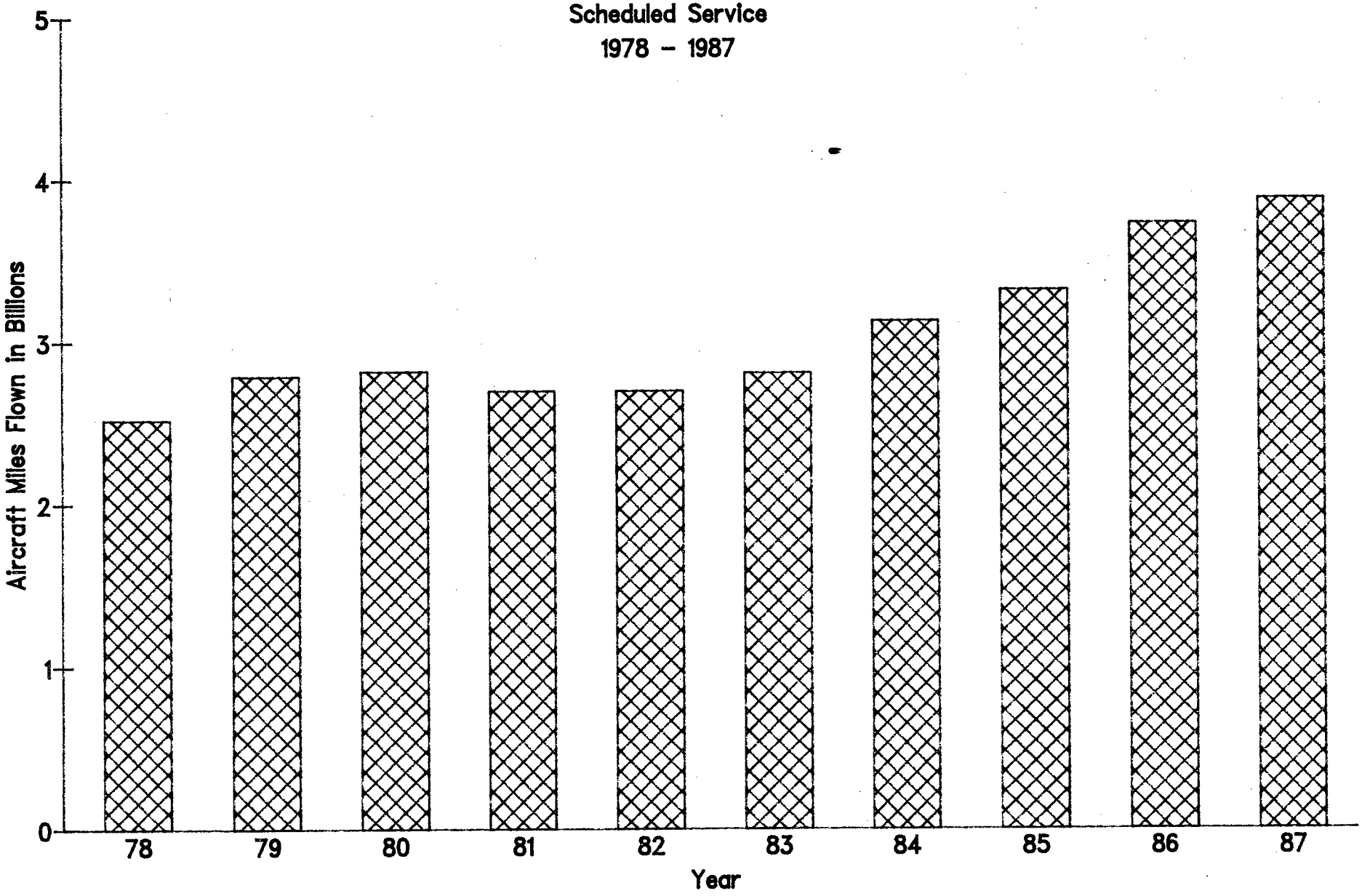


FIGURE 2-3
AIRCRAFT DEPARTURES
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Scheduled Service
1978 - 1987

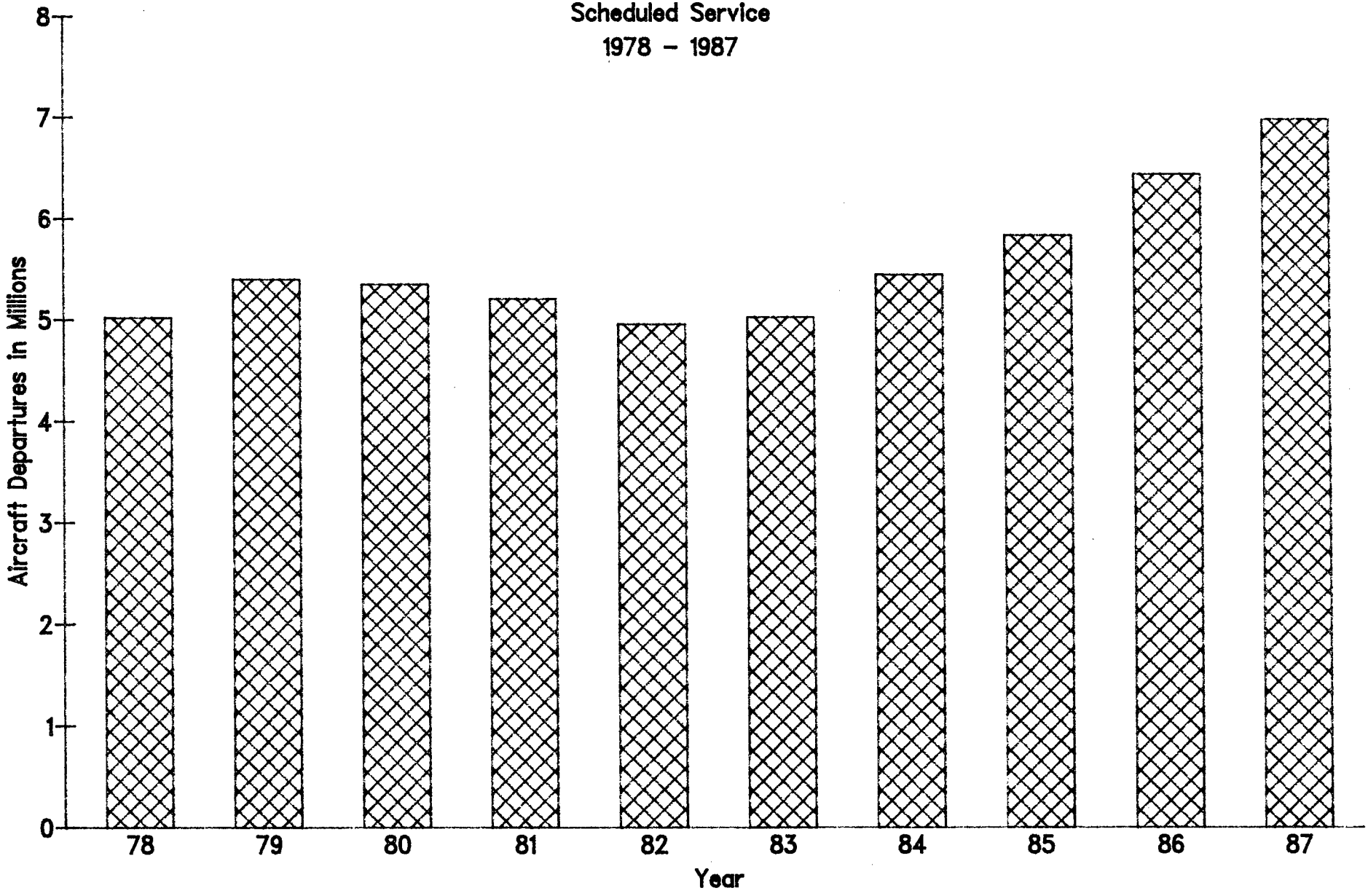


FIGURE 2-4
STAGE LENGTHS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Scheduled Service
1978 - 1987

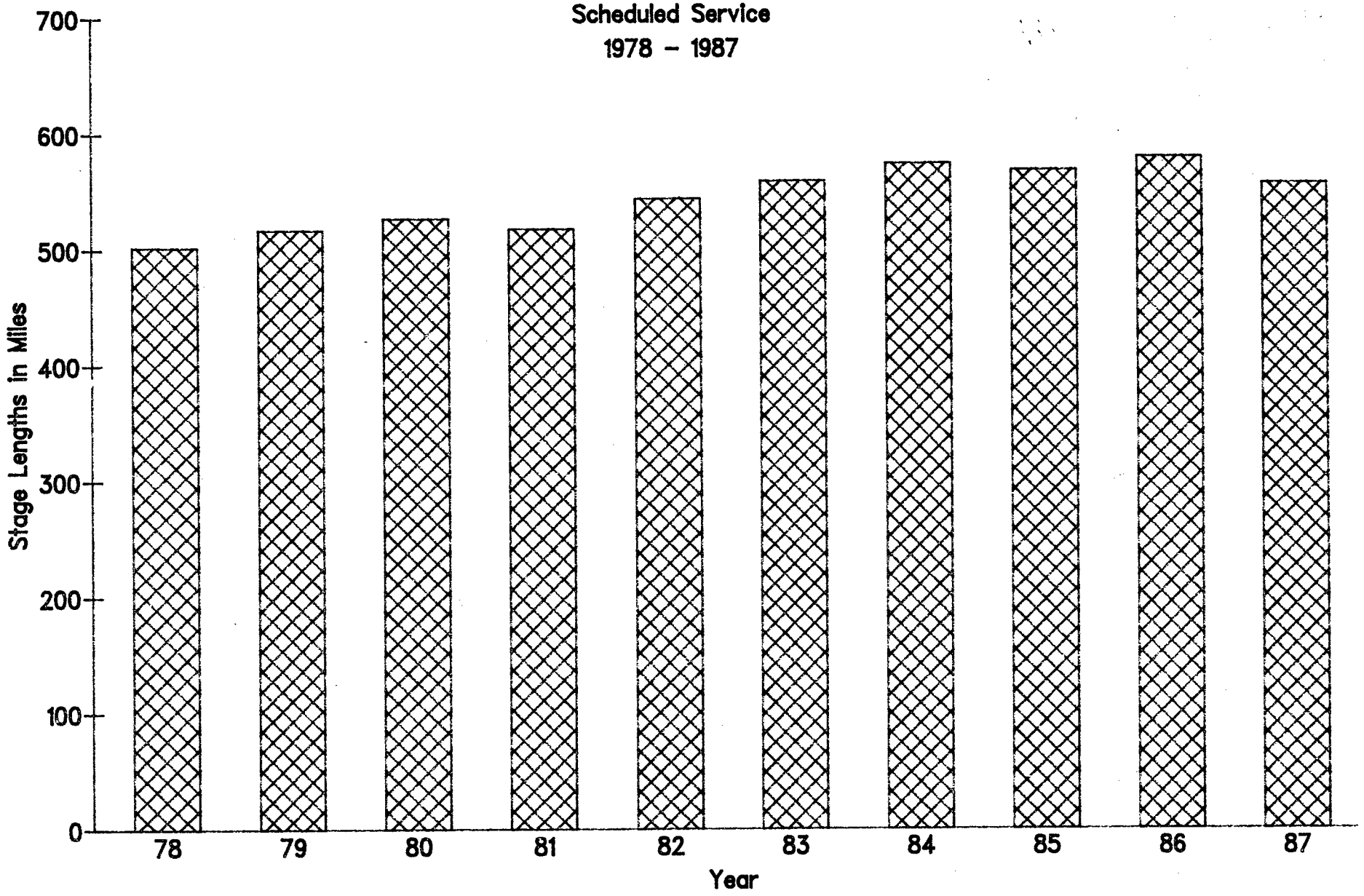
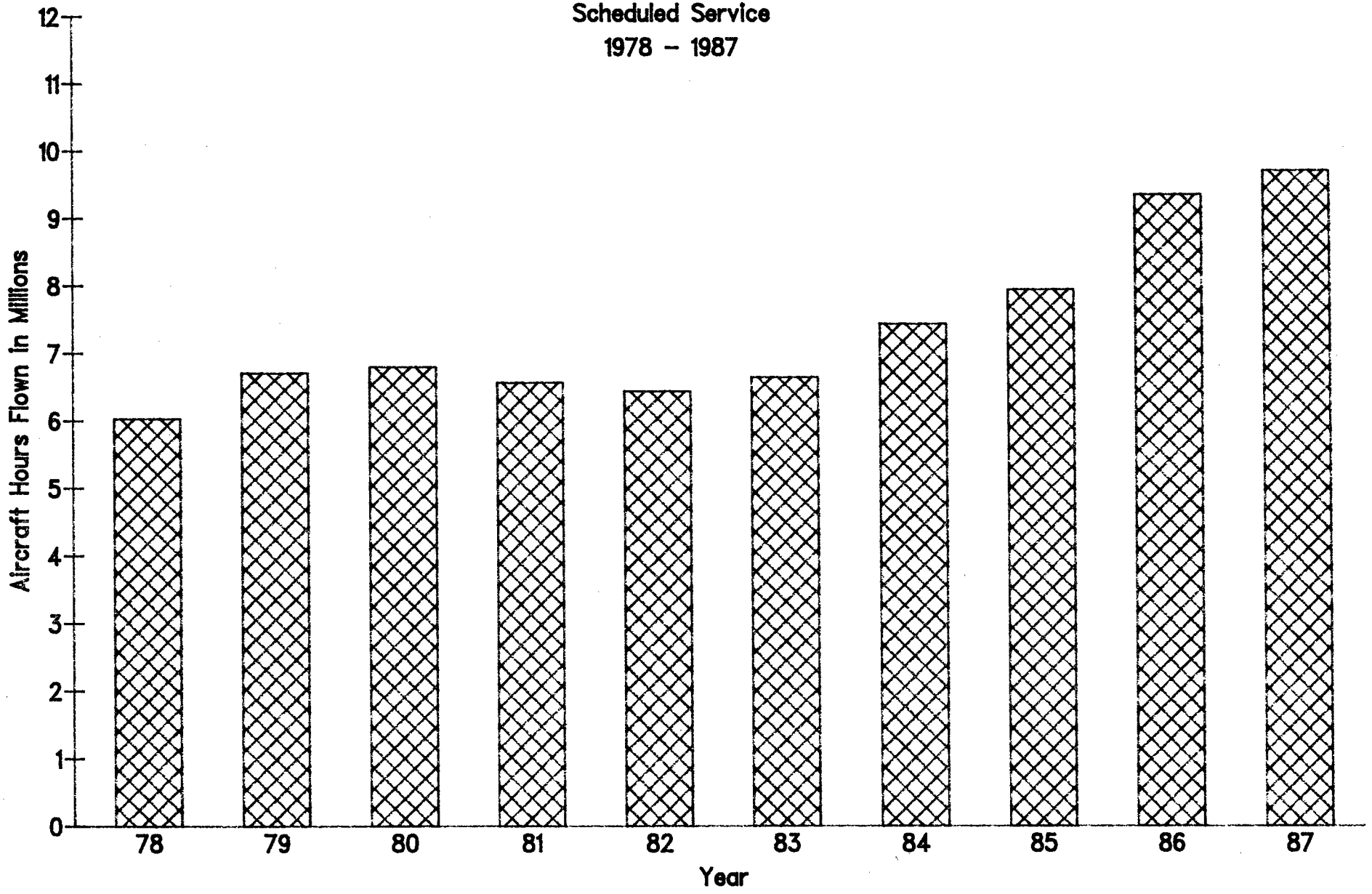


FIGURE 2-5
AIRCRAFT HOURS FLOWN
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Scheduled Service
1978 - 1987



2.2.2 Nonscheduled Service

Part 121 operators conducting nonscheduled service accounted for approximately 4.3% of the miles flown, 4.3% of hours flown, 3% of departures, and carried 1.8% of the passengers in 121 operations in 1987. Similar to Part 121 scheduled service, 121 operators conducting nonscheduled service have shown significant growth over the last several years. Aircraft miles flown, hours flown, departures, and passenger enplanements have increased by 100%, 115%, 125%, and 78.3%, respectively, since 1978 (Figures 2-6, 2-7, 2-8, and 2-9). While average stage length fluctuated during the ten-year period, the overall result has been an 11% decrease, (from 917 miles in 1978 to 815 miles in 1987) (Figure 2-10). Unlike scheduled service where stage lengths have generally increased over the last several years, the growth in nonscheduled departures has exceeded the growth in aircraft miles flown, yielding decreased stage lengths.

FIGURE 2-6
AIRCRAFT MILES FLOWN
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Nonscheduled Service
1978 - 1987

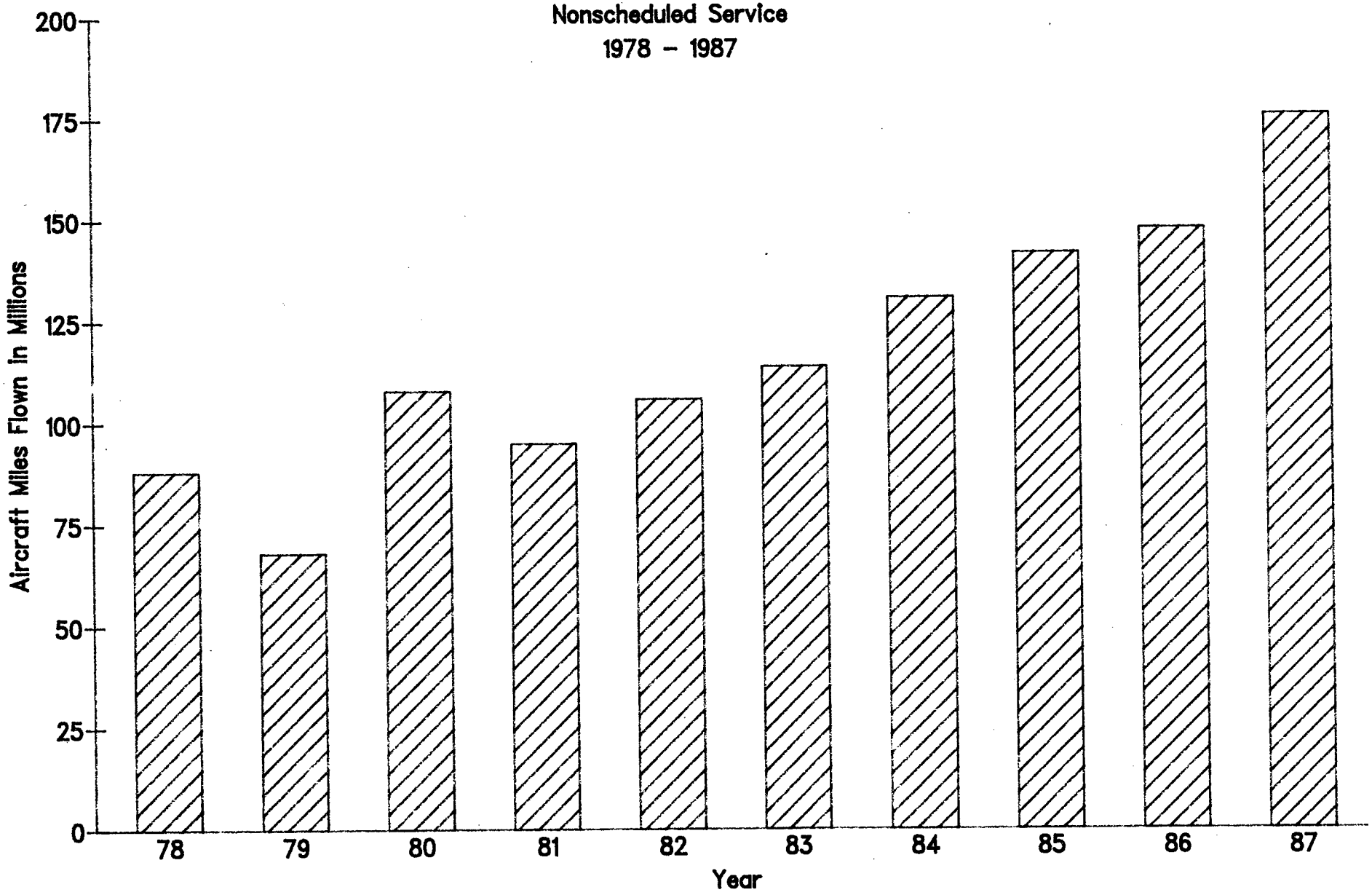


FIGURE 2-7
AIRCRAFT HOURS FLOWN
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Nonscheduled Service
1978 - 1987

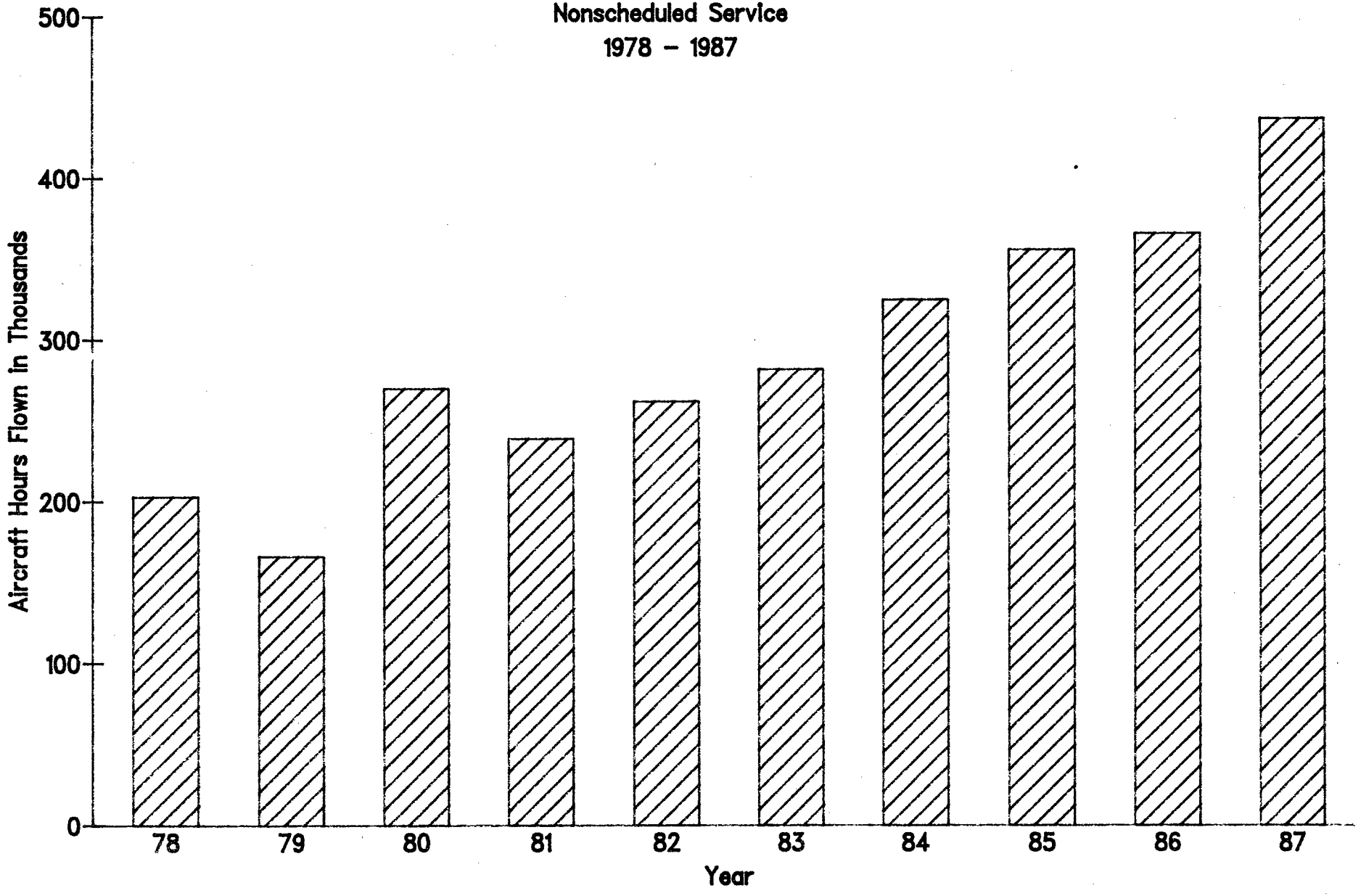


FIGURE 2-8
AIRCRAFT DEPARTURES
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Nonscheduled Service
1978 - 1987

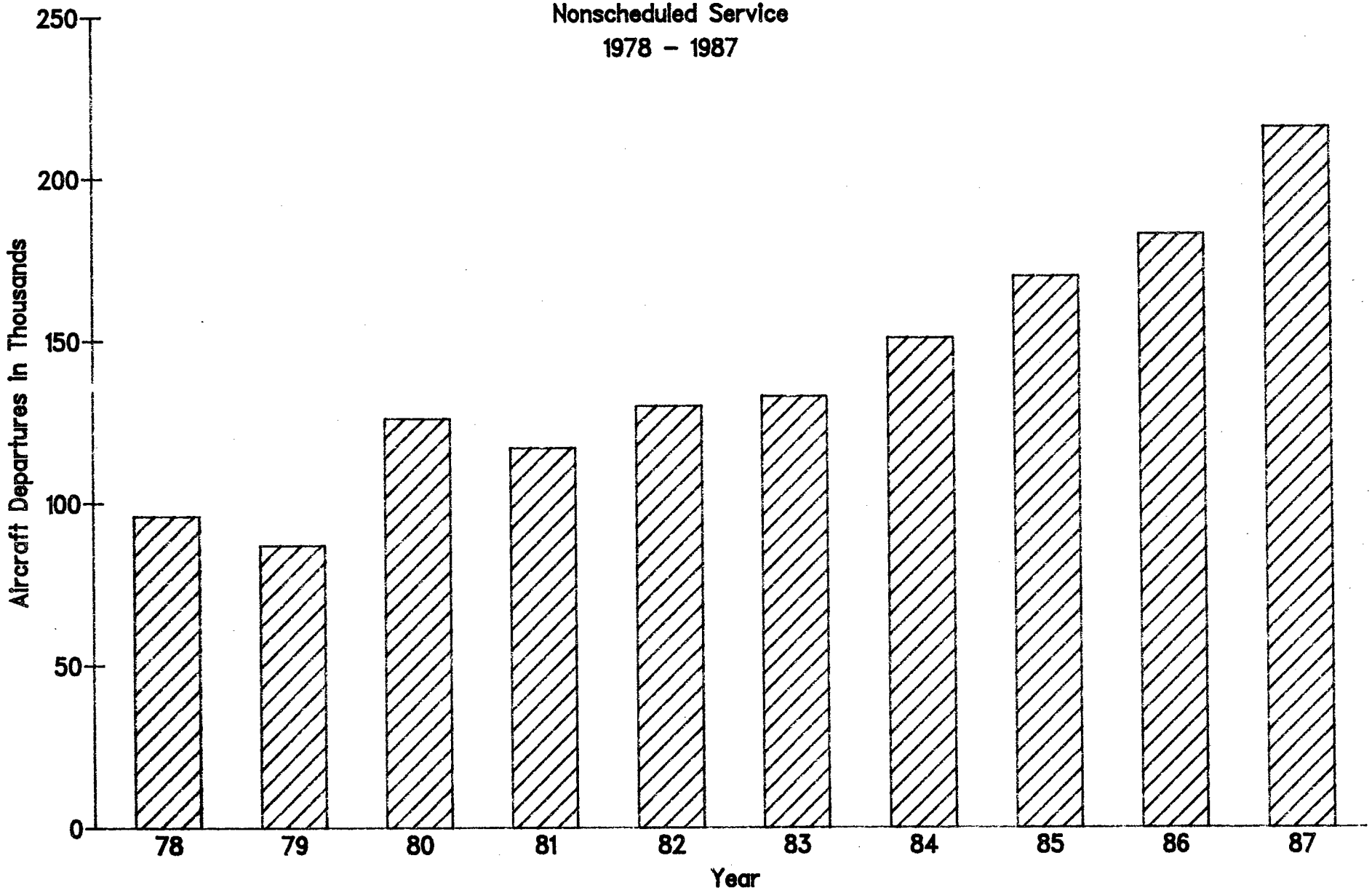


FIGURE 2-9
REVENUE PASSENGER ENPLANEMENTS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Nonscheduled Service
1978 - 1987

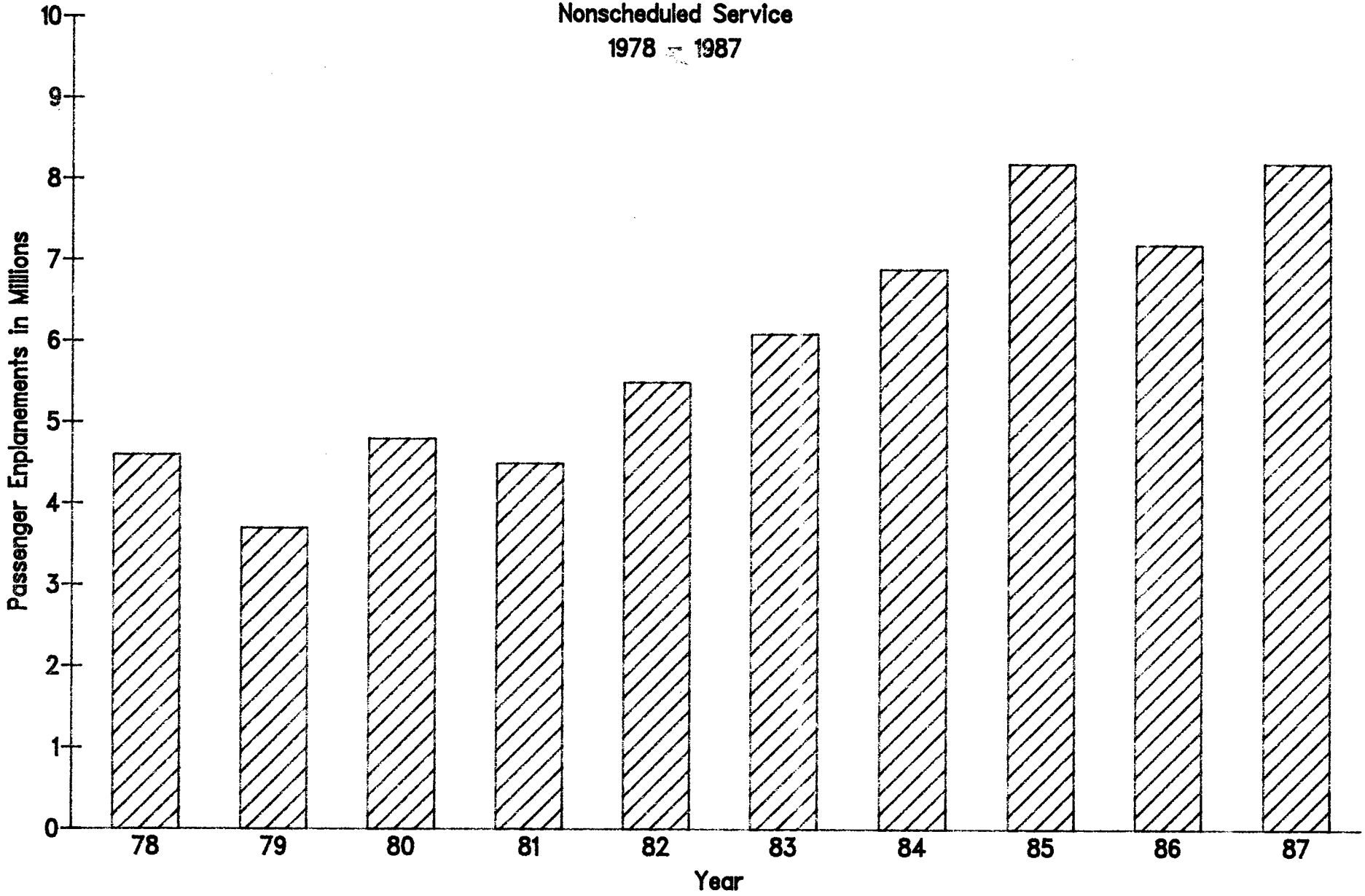
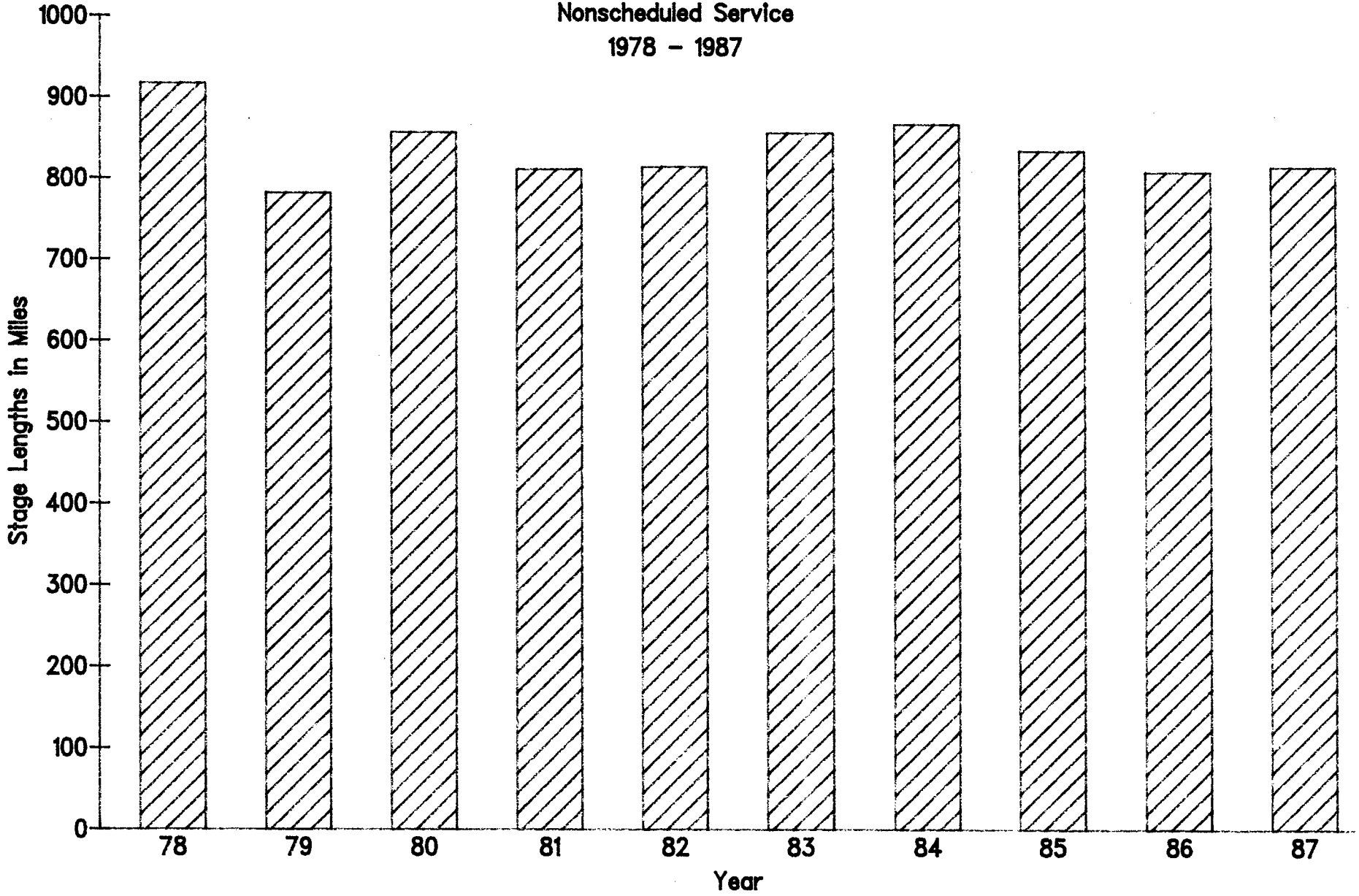


FIGURE 2-10
STAGE LENGTHS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
Nonscheduled Service
1978 - 1987



2.3 COMMUTER OPERATING ENVIRONMENT

Commuter air carriers continued to exhibit growth since 1978. As shown in Figures 2-11, 2-12, and 2-13, aircraft miles flown by commuters have increased by 16.4% since 1978 with a slight increase from 254 million in 1986 to 263 million in 1987; aircraft flight hours have increased by 12.3% since 1978 and increased by 3.5% since last year; and departures have increased by 22.5% since 1978 and increased by 3.8% since last year. The more rapid growth in number of departures relative to number of miles flown indicates that stage lengths are decreasing for this class of carriers. The average stage length decreased from 113 miles in 1978 to 107 miles in 1987 (Figure 2-14).

FIGURE 2-11
AIRCRAFT MILES FLOWN
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
Scheduled Service
1978 - 1987

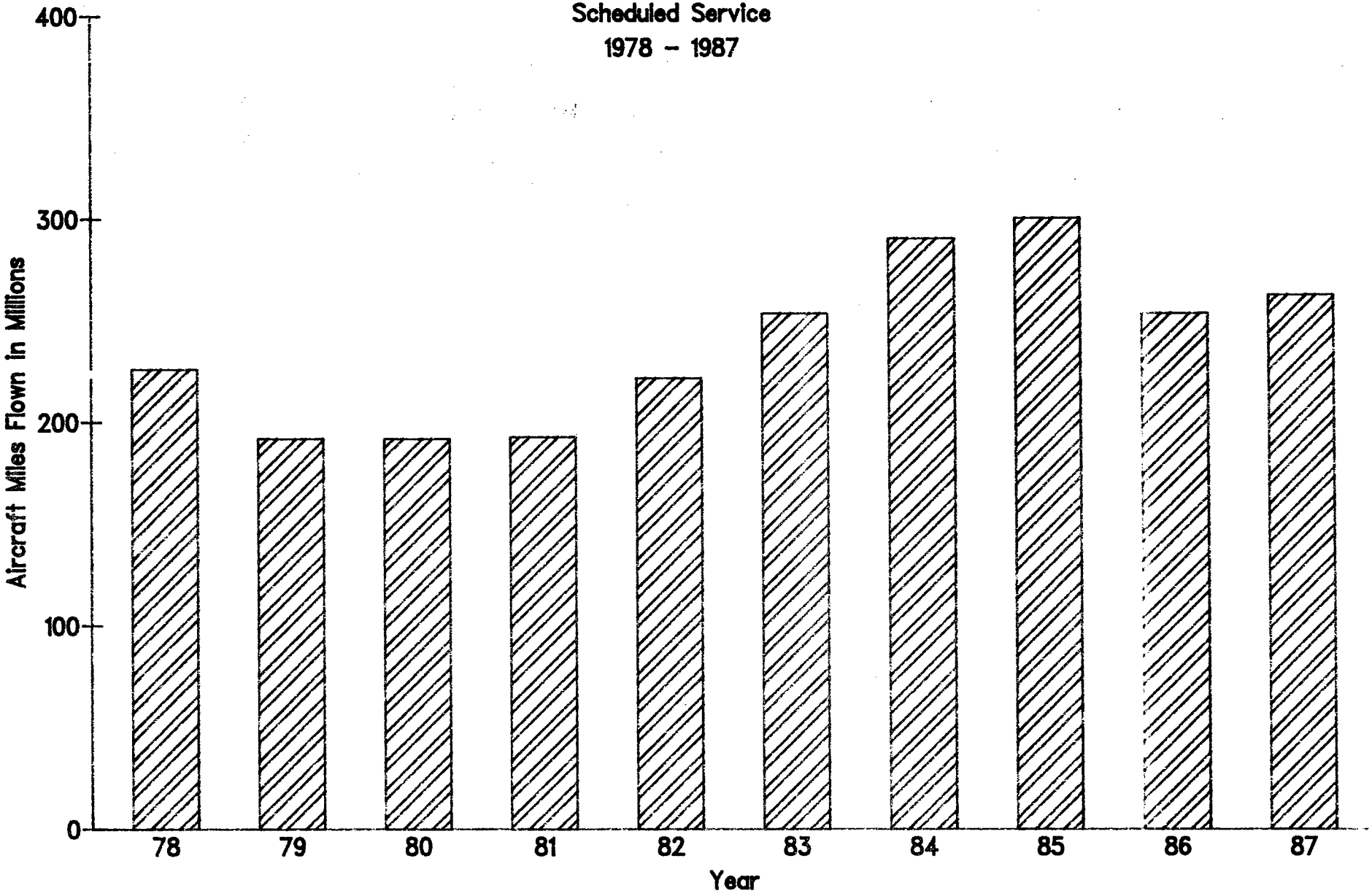


FIGURE 2-12
AIRCRAFT HOURS FLOWN
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
Scheduled Service
1978 - 1987

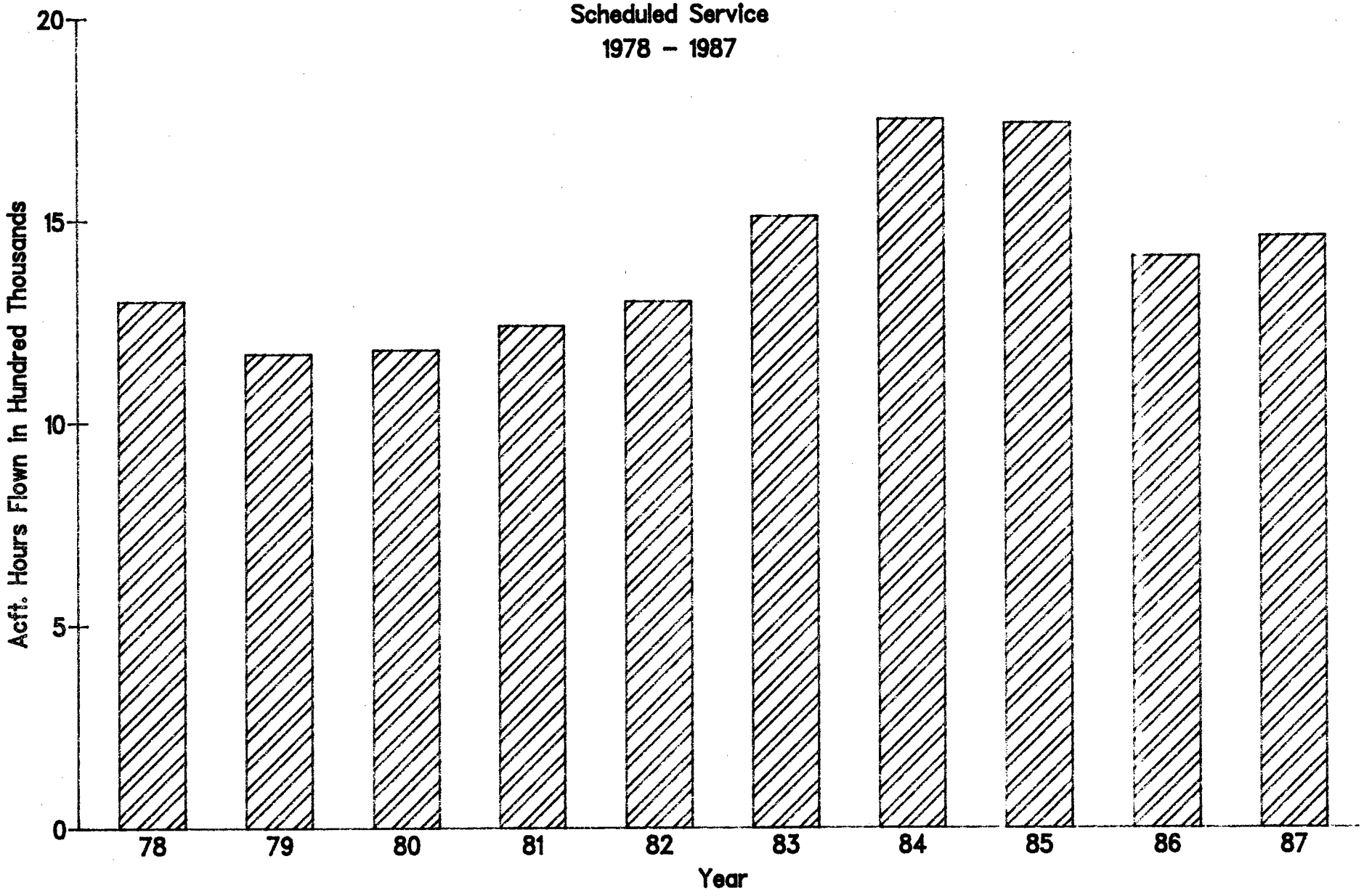


FIGURE 2-13
AIRCRAFT DEPARTURES
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
Scheduled Service
1978 - 1987

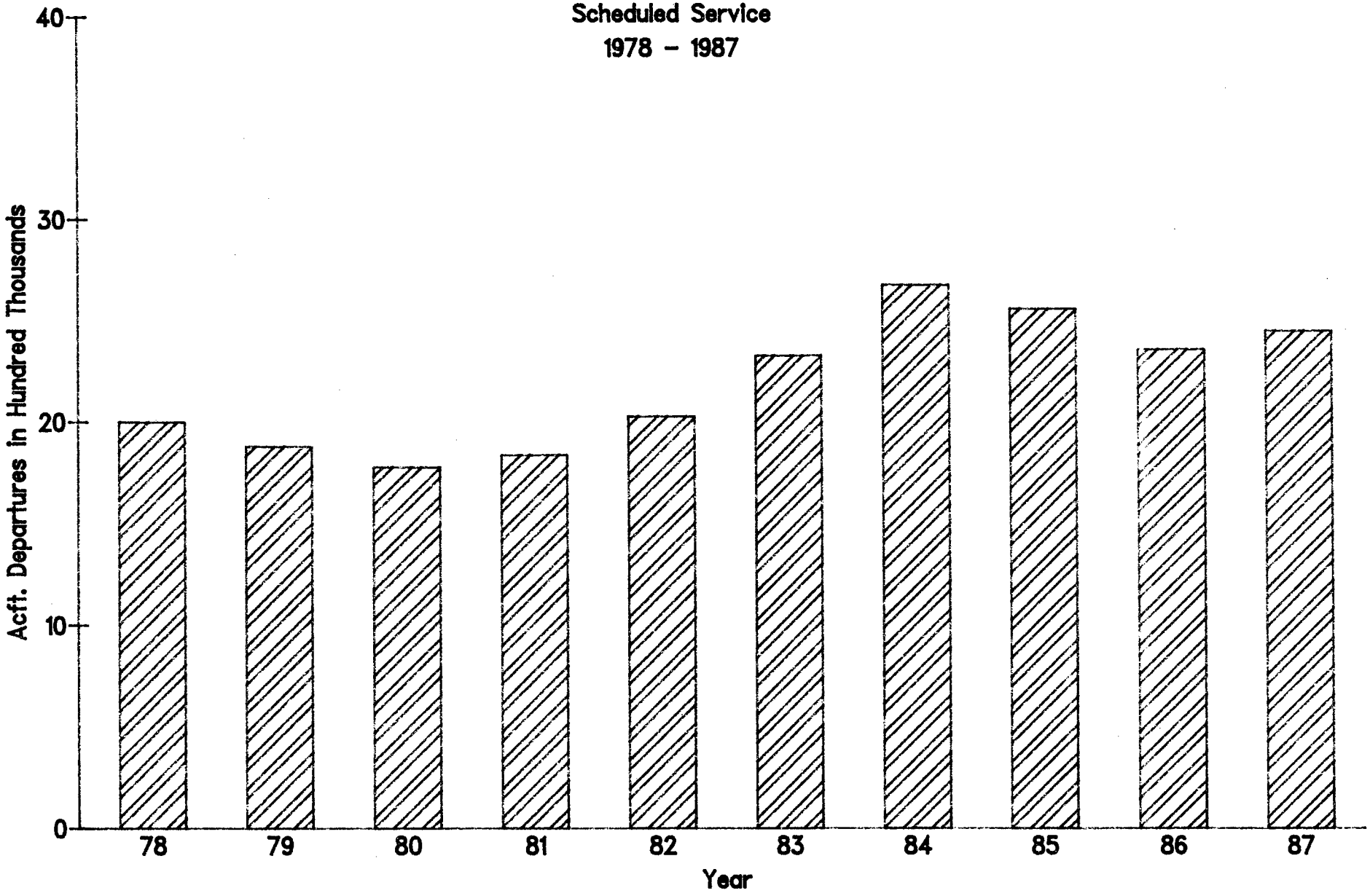
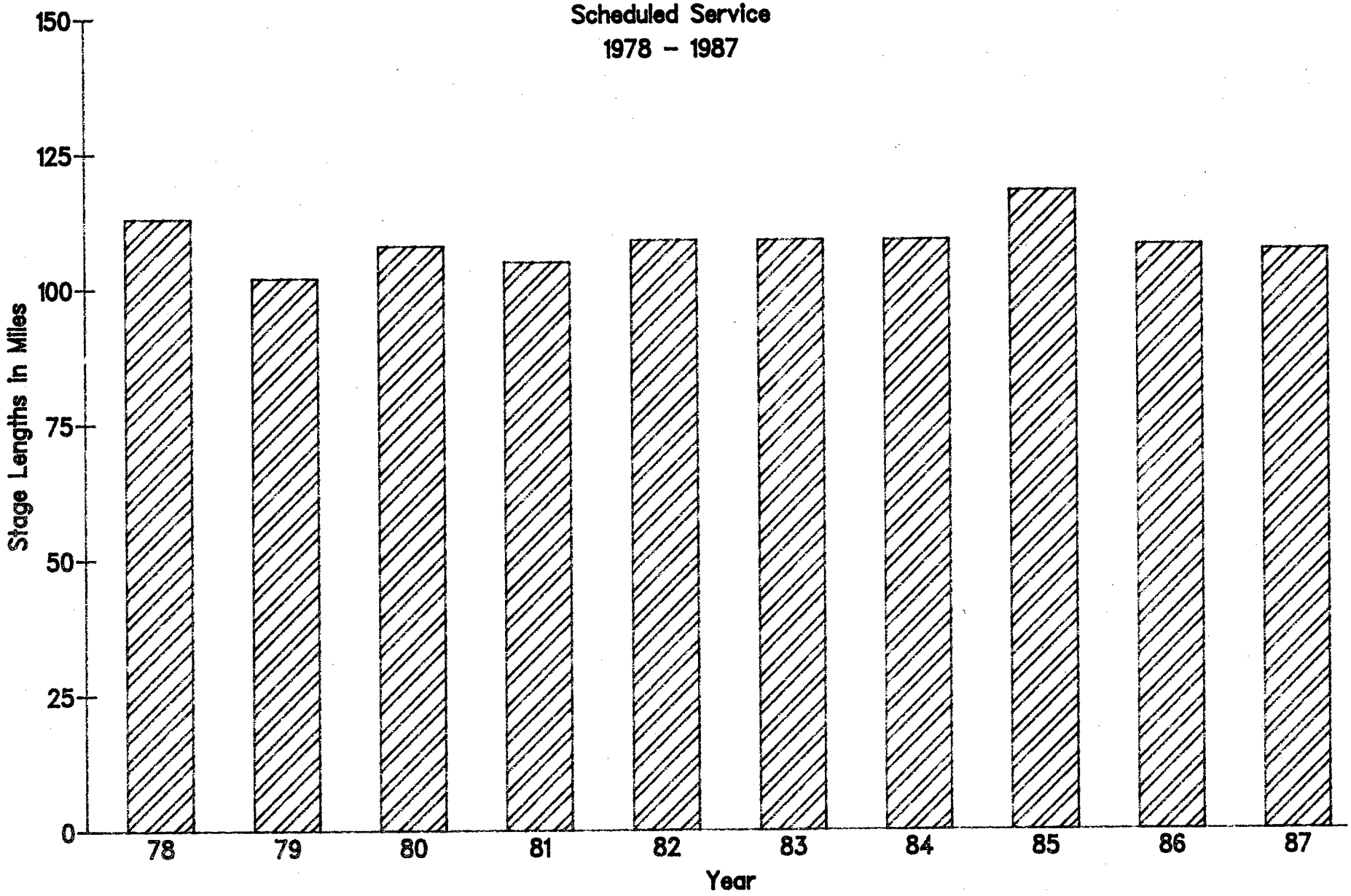


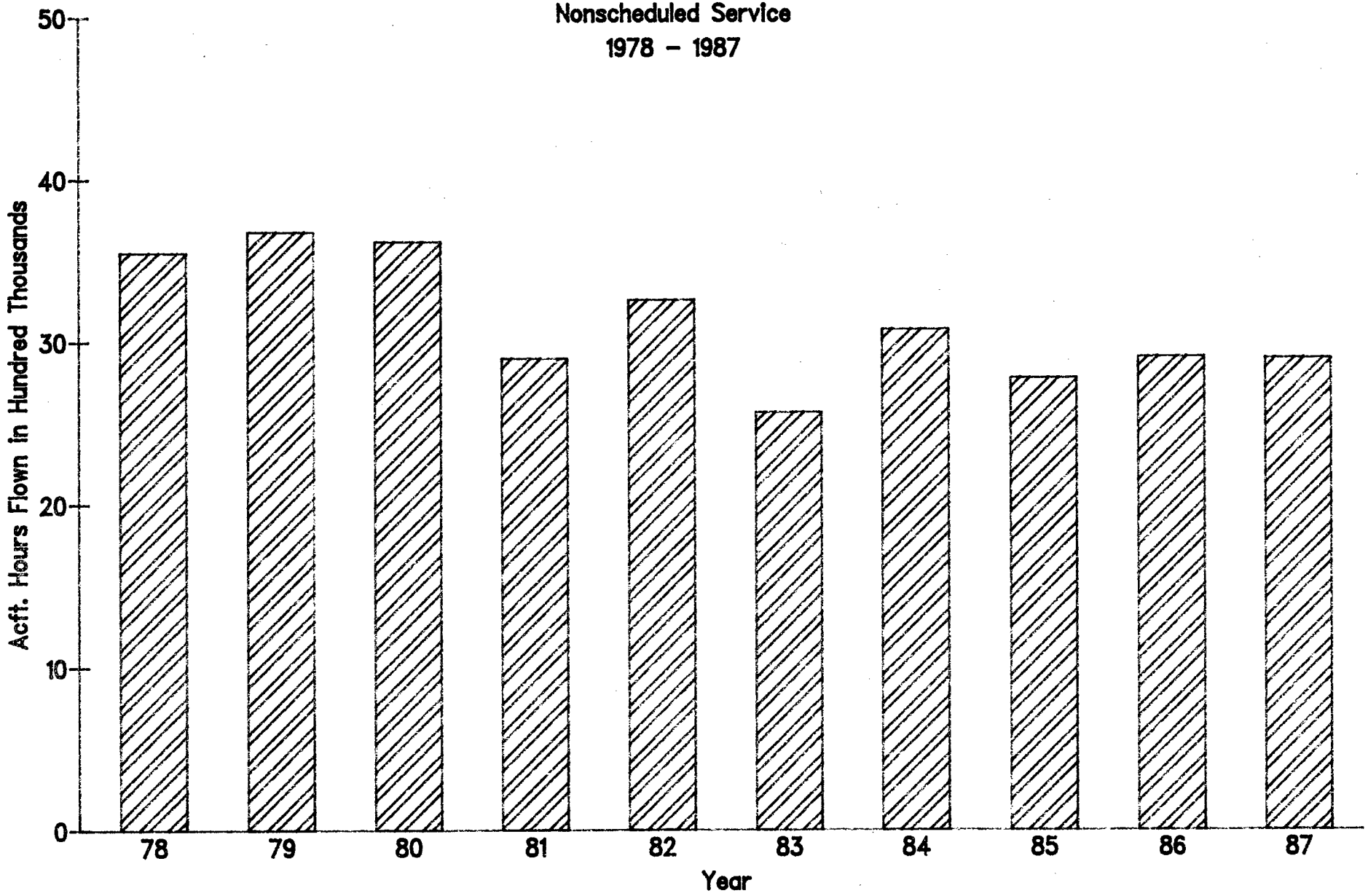
FIGURE 2-14
STAGE LENGTHS
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
Scheduled Service
1978 - 1987



2.4 AIR TAXI OPERATING ENVIRONMENT

Only a limited amount of activity data is currently available for on-demand air taxi operators. Estimates of air taxi hours flown are shown in Figure 2-15. Since 1978, aircraft flight hours have declined by 18.3% from 3.6 million hours in 1978 to 2.9 million in 1987. As of year-end 1987, there were approximately 3,800 on-demand air taxi operators, down from the 4,200 in this class service for 1978.

FIGURE 2-15
AIRCRAFT HOURS FLOWN
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
Nonscheduled Service
1978 - 1987



2.5 HUB AND SPOKE NETWORKS

An important indicator of the changing operating environment in commercial aviation is the average stage length for various operator classes. The average stage length for scheduled Part 121 air carriers has increased by 10.6% since 1978 and that of Part 135 commuters has decreased by 5%. One factor which is partially responsible for this trend is the transition to hub and spoke operations. Part 121 air carriers are evolving toward longer distance major city pairs; whereas, commuter operators are serving the smaller cities feeding into these central locations. These practices allow route length to be more economically tailored to aircraft fleet composition and also achieve greater efficiency in multiple connections.

In addition, large air carriers are using scheduling of flights as part of their strategy of establishing key hubs to interline their own traffic. The carriers are scheduling arrivals from a large number of their spoke airports into a major hub during the first part of a one- to two-hour time period; during the second time period, the carriers have departures back out along the spoke network. This allows the carrier to keep a large portion of traffic within its own system from origin to destination through the use of connecting flights. Along with the increase in the number of routes served by this new hub and spoke environment, there has been an aggregate growth in scheduled revenue passenger enplanements.

3.0 REVIEW OF ACCIDENT, INCIDENT, AND ENFORCEMENT STATISTICS

3.1 INTRODUCTION

This chapter contains a review of accidents, incidents, and enforcement statistics by calendar year for Part 121 and Part 135 operators.

3.2 PART 121 AIR CARRIERS

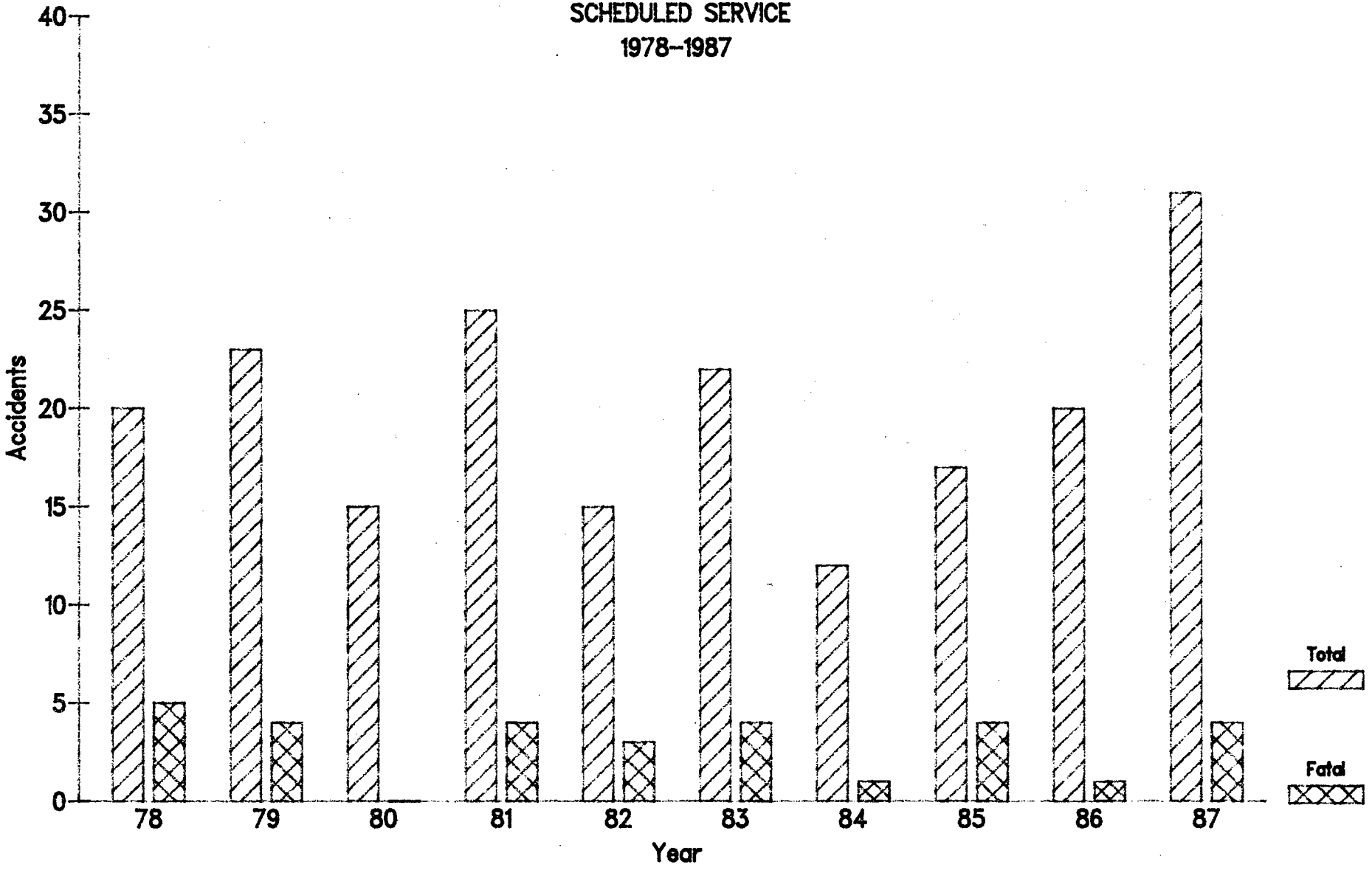
3.2.1 Scheduled Service

Accident and incident statistics for Part 121 carriers in scheduled service are presented in Appendix A, Table 1. These data show no evidence that deregulation has adversely affected the safety of these carriers. There were 4 fatal accidents resulting in 231 fatalities in this class service in 1987. The fatal crash of a Pacific Southwest Airlines flight killing 43, in which sabotage is suspected to be the cause of the accident, is excluded in the rate calculations. Although the fatal accident rate has fluctuated during the past ten years, the 1978 rate of 0.083 fatal accidents per 100,000 flight hours has decreased by more than 60% to 0.031 in 1987. The 1978 total accident rate of 0.332 accidents per 100,000 flight hours dropped slightly to a 1987 rate of 0.309. This new accident rate translates to one accident in 323,625 Part 121 scheduled air carrier aircraft flight hours. The fatality rate of 2.65 fatalities per 100,000 flight hours in 1978 decreased to a 1987 rate of 1.94. These data are presented in Figures 3-1 through 3-4. The incident rate for Part 121 carriers in both scheduled and nonscheduled service for 1987 of 7.01 incidents per 100,000 flight hours shows a 20% decrease from the 1986 rate of 8.81 and a 57% decrease from the 1978 rate of 16.48. These data are presented in Figures 3-5 and 3-6.

Table 2 in Appendix A presents enforcement data for Part 121 carriers (scheduled and nonscheduled) for the last 6 years. Enforcement case data, for both operating and personnel certificates, are included in this table. The trend in enforcement cases initiated increased yearly from calendar year 1982 to calendar year 1986. The calendar year 1987 figure of 3,266 cases is lower than the corresponding 1986 figure; however, since counts for enforcement cases initiated in any given year can take from six months to over a year to appear in the EIS data base, the 1987 figure is still preliminary and year-end count comparisons with other historical totals may not be valid. The 1986 rate of

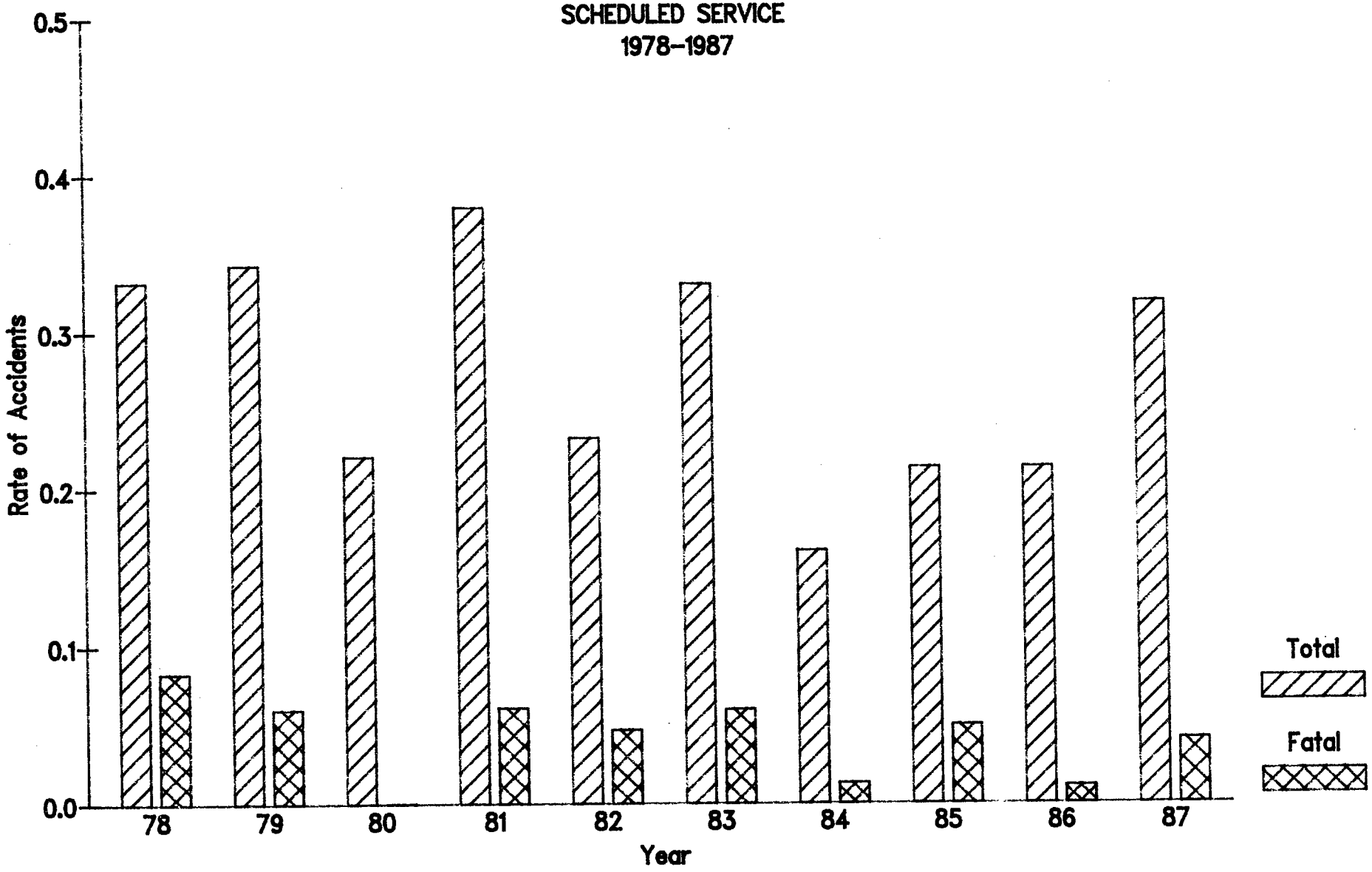
39.47 enforcement cases initiated per 100,000 flight hours is the highest rate over the past 6 years for which the data are maintained. These significant increases may be attributed to the increased emphasis by the FAA on inspection and surveillance of Part 121 carriers under the National Aviation Safety Inspection Program (NASIP) initiated in 1986. The number of enforcement actions completed in a given year can include completion of cases initiated in prior years. The numbers of revocations and suspensions, both by year of initiation and by year of completion, have steadily increased since 1982. These data are presented in Figures 3-7 through 3-11.

FIGURE 3-1
ACCIDENTS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 1

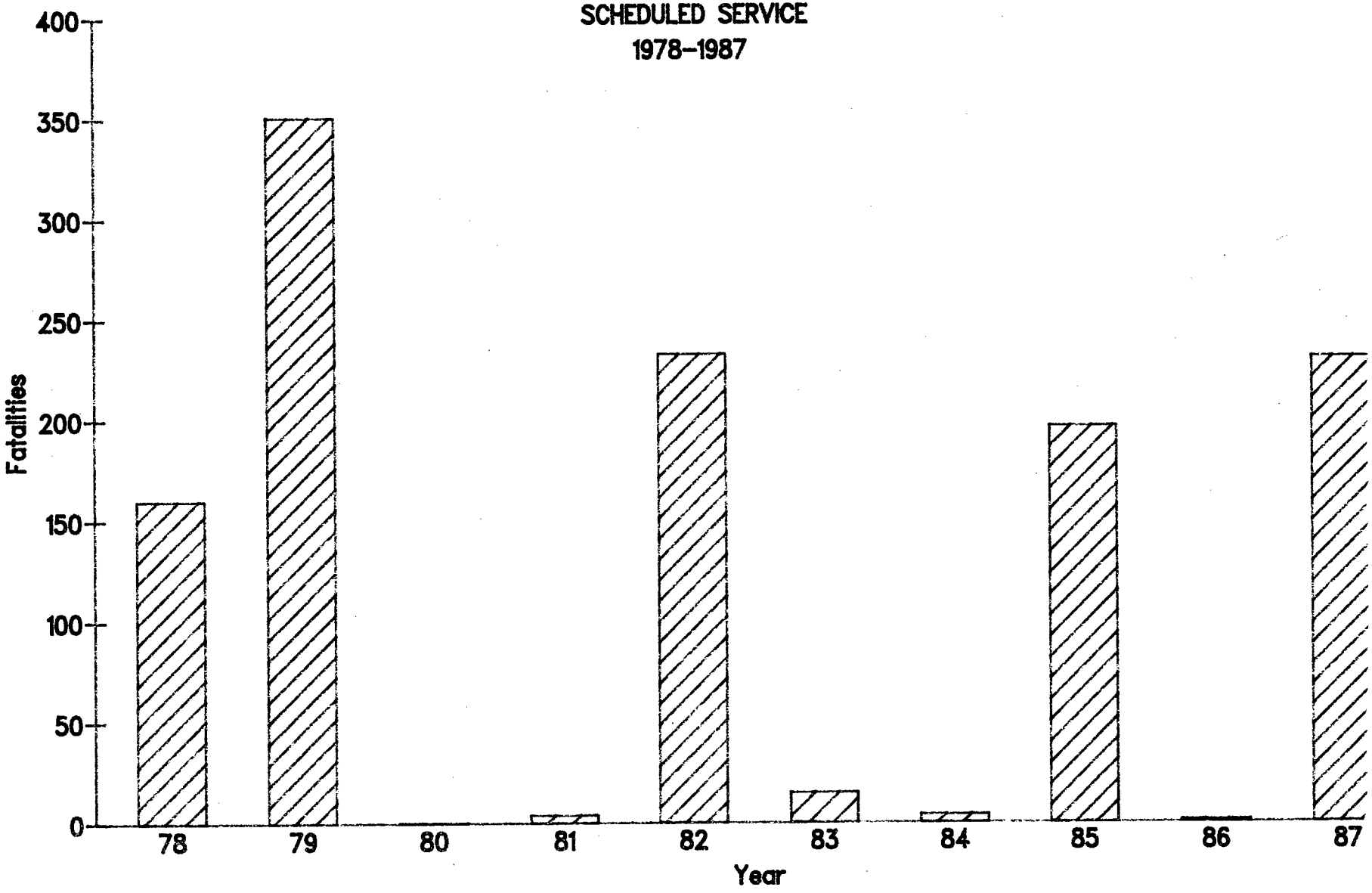
FIGURE 3-2
ACCIDENT RATES
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 1

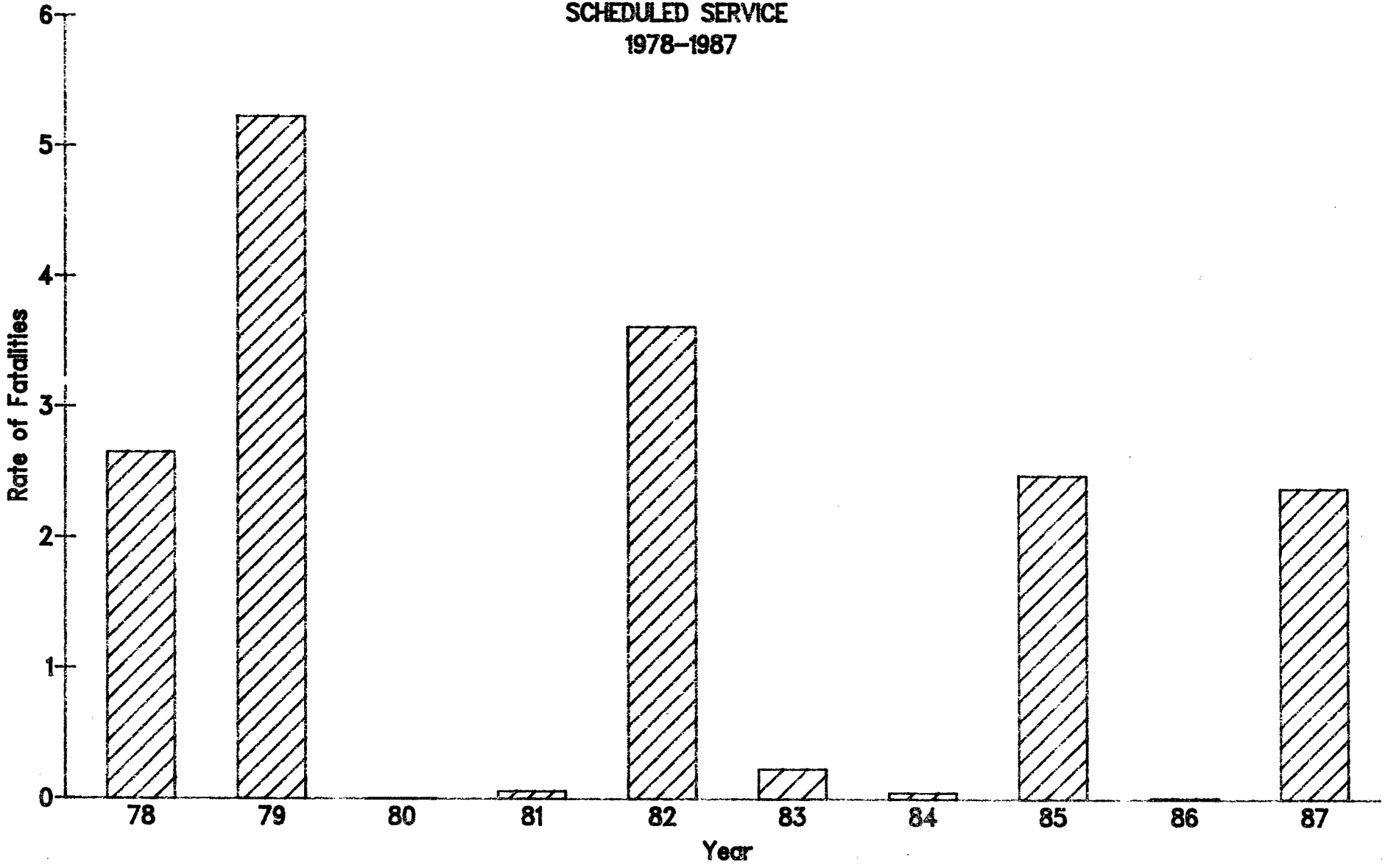
Note: All rates are per 100,000 flight hours.

FIGURE 3-3
FATALITIES
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 1

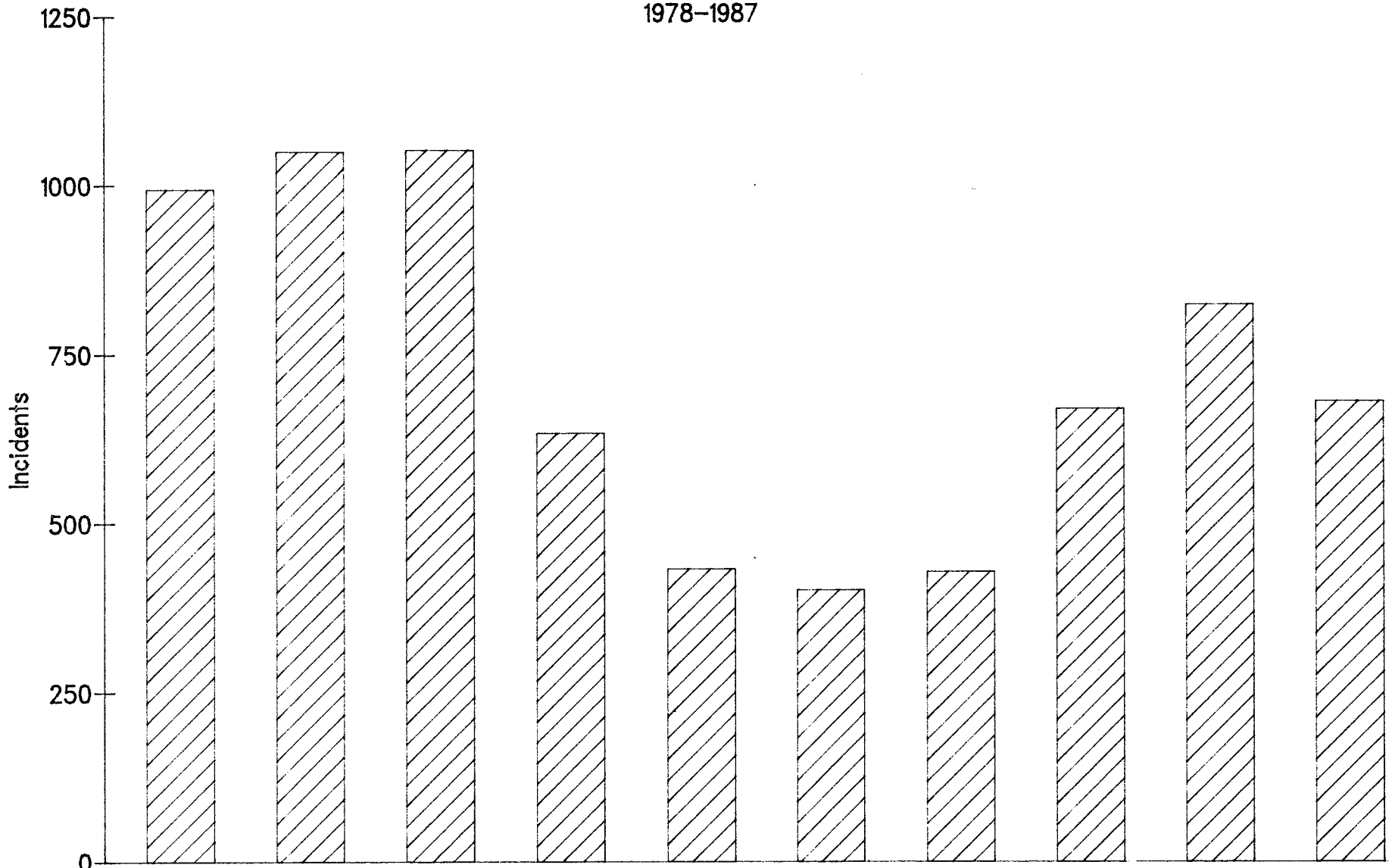
FIGURE 3-4
FATALITY RATES
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 1

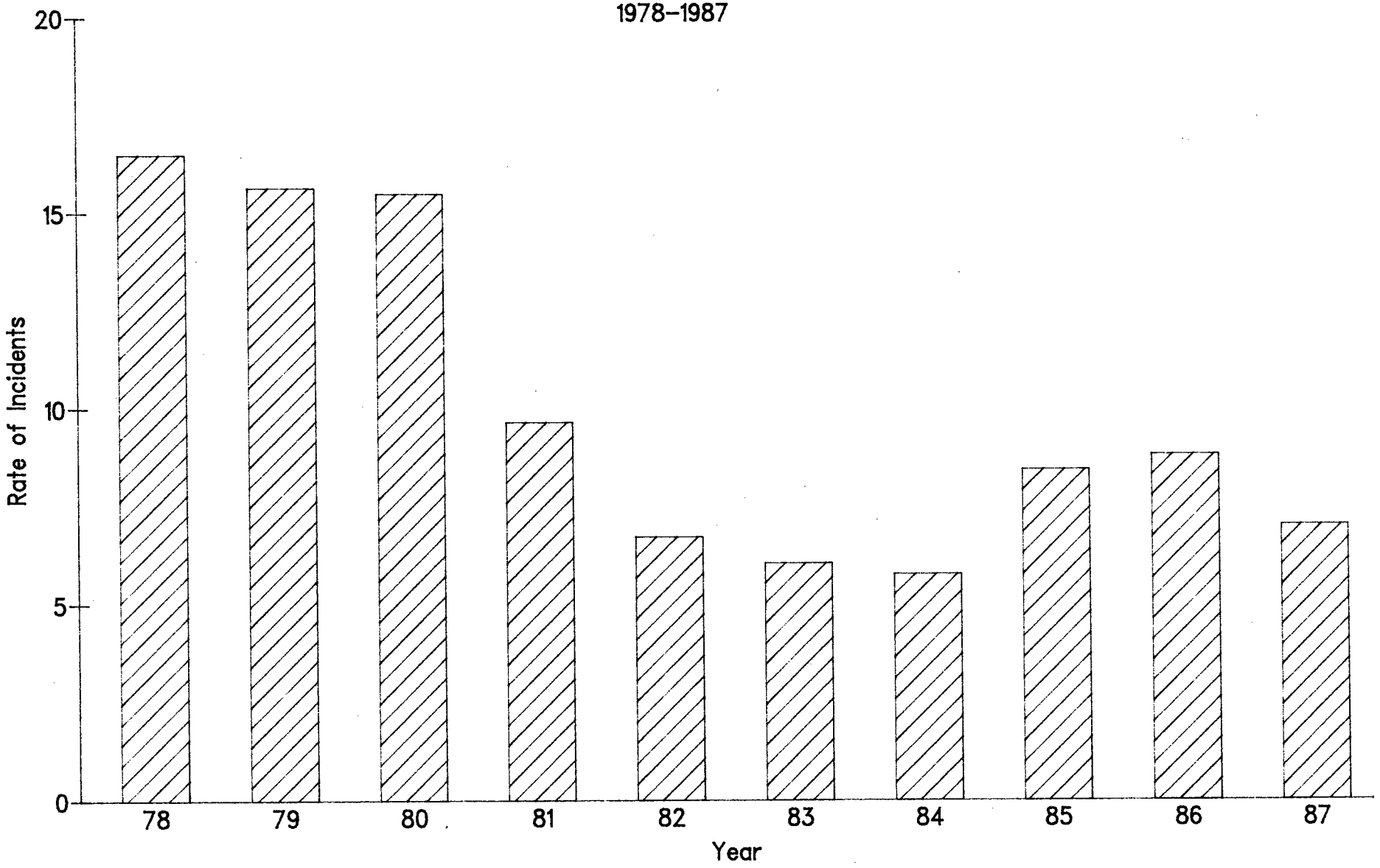
Note: All rates are per 100,000 flight hours.

FIGURE 3-5
INCIDENTS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
1978-1987



See Appendix A, Table 1

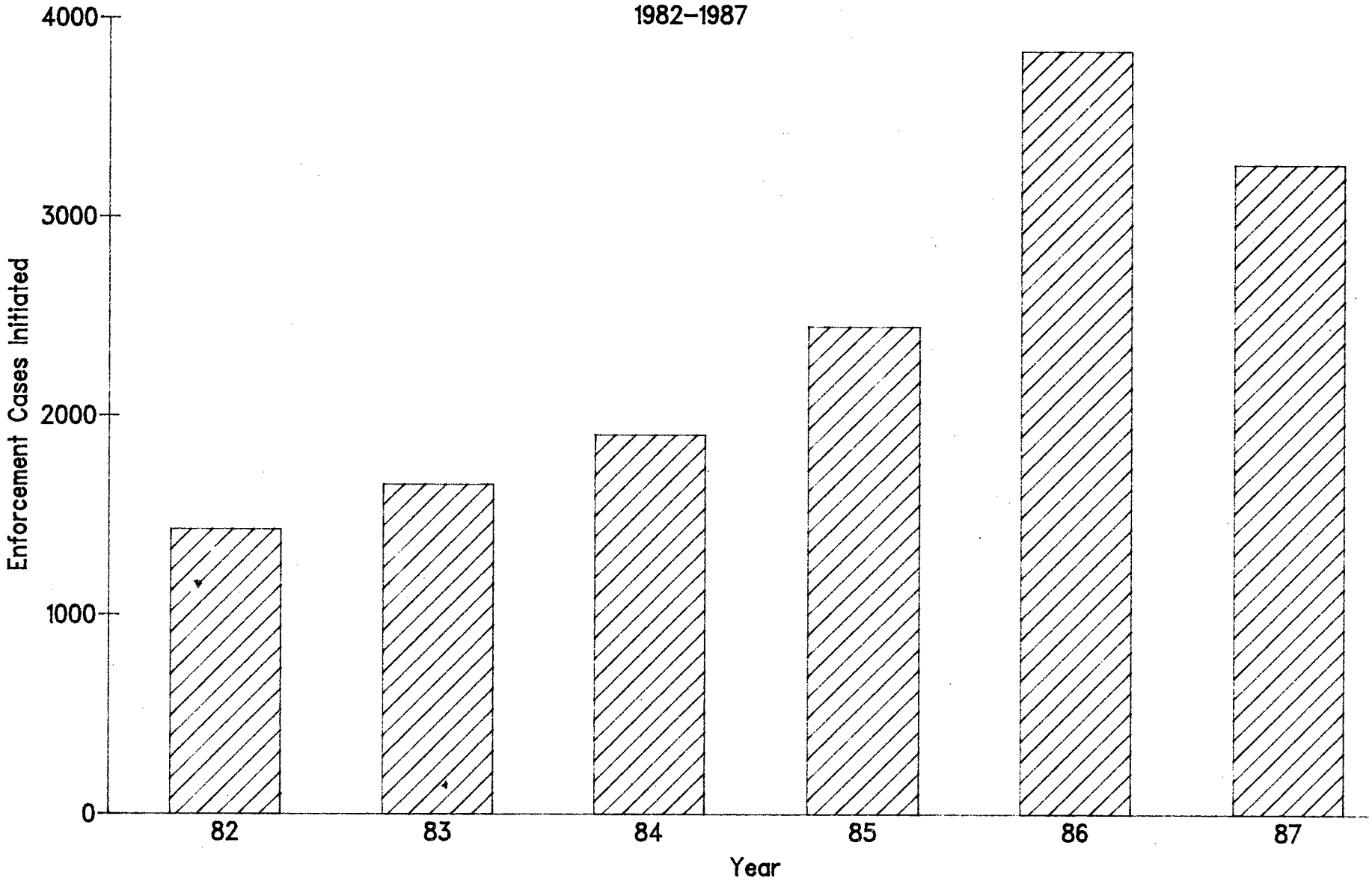
FIGURE 3-6
INCIDENT RATES
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
1978-1987



See Appendix A, Table 1

Note: All rates are per 100,000 flight hours

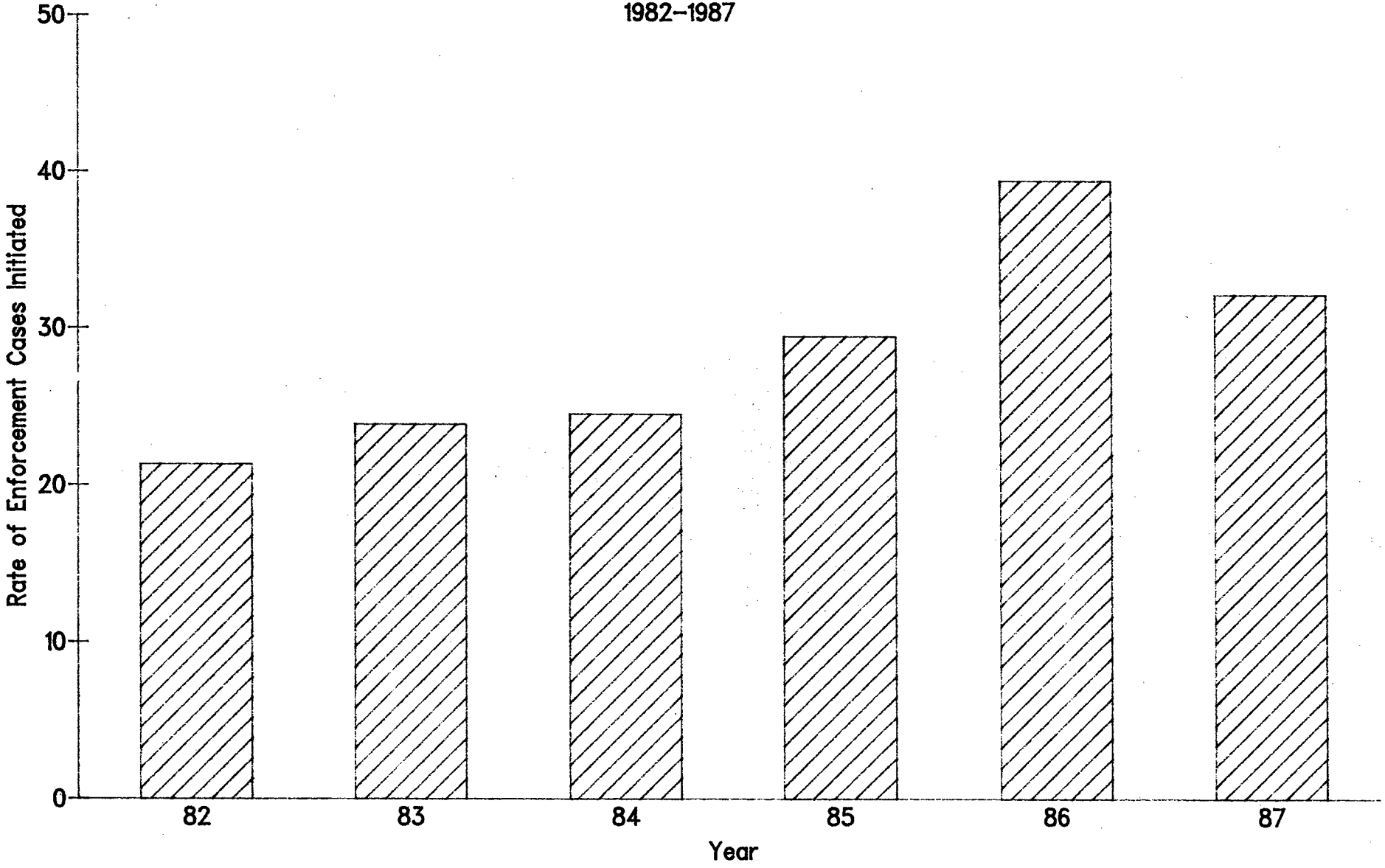
FIGURE 3-7
ENFORCEMENT CASES INITIATED
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
1982-1987



See Appendix A, Table 2

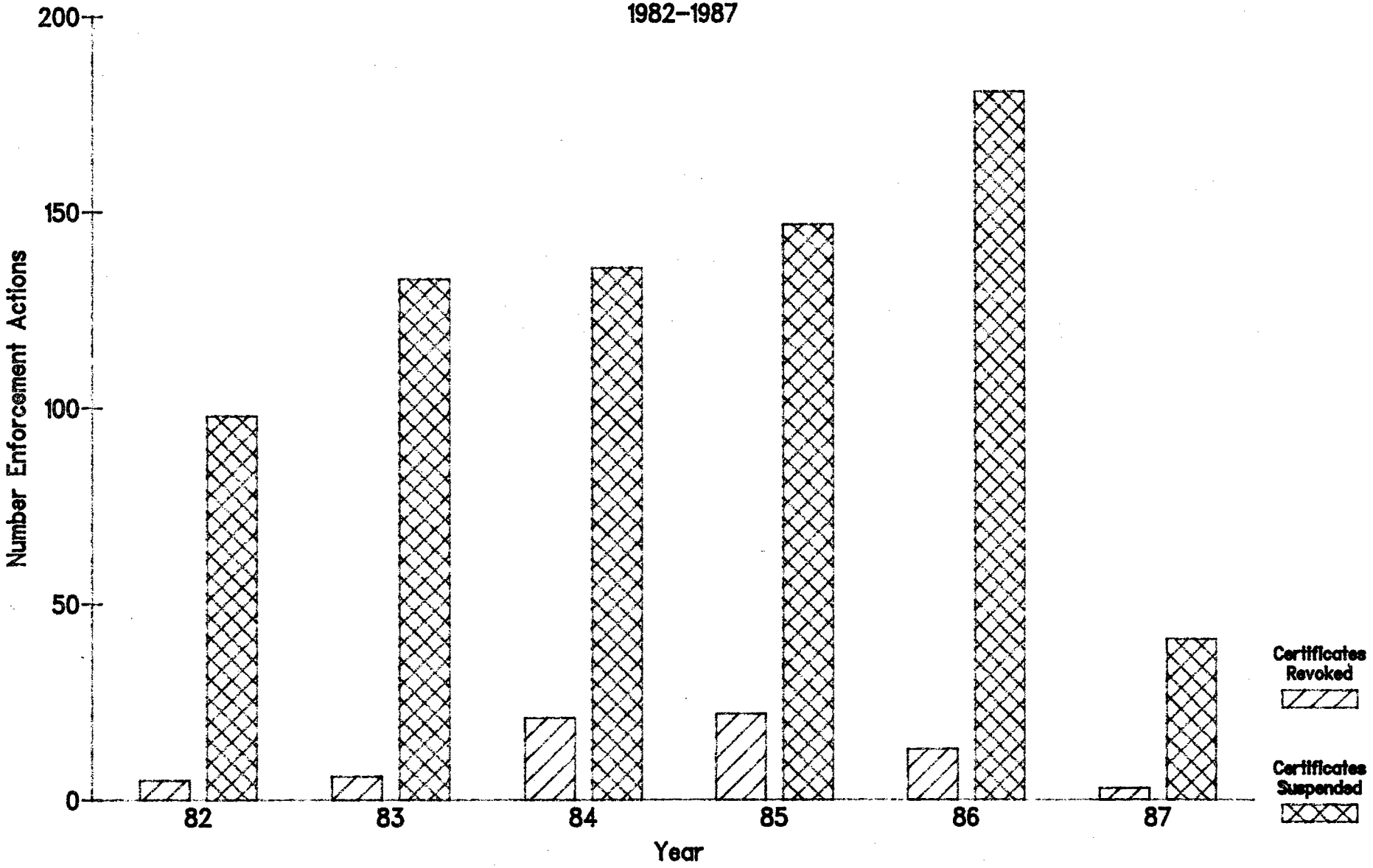
Data as of 1-22-88 are preliminar

FIGURE 3-8
RATE OF ENFORCEMENT CASES INITIATED
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
1982-1987



See Appendix A, Table 2 Data as of 1-22-88 are preliminary. Note: All rates are per 100,000 flight hours.

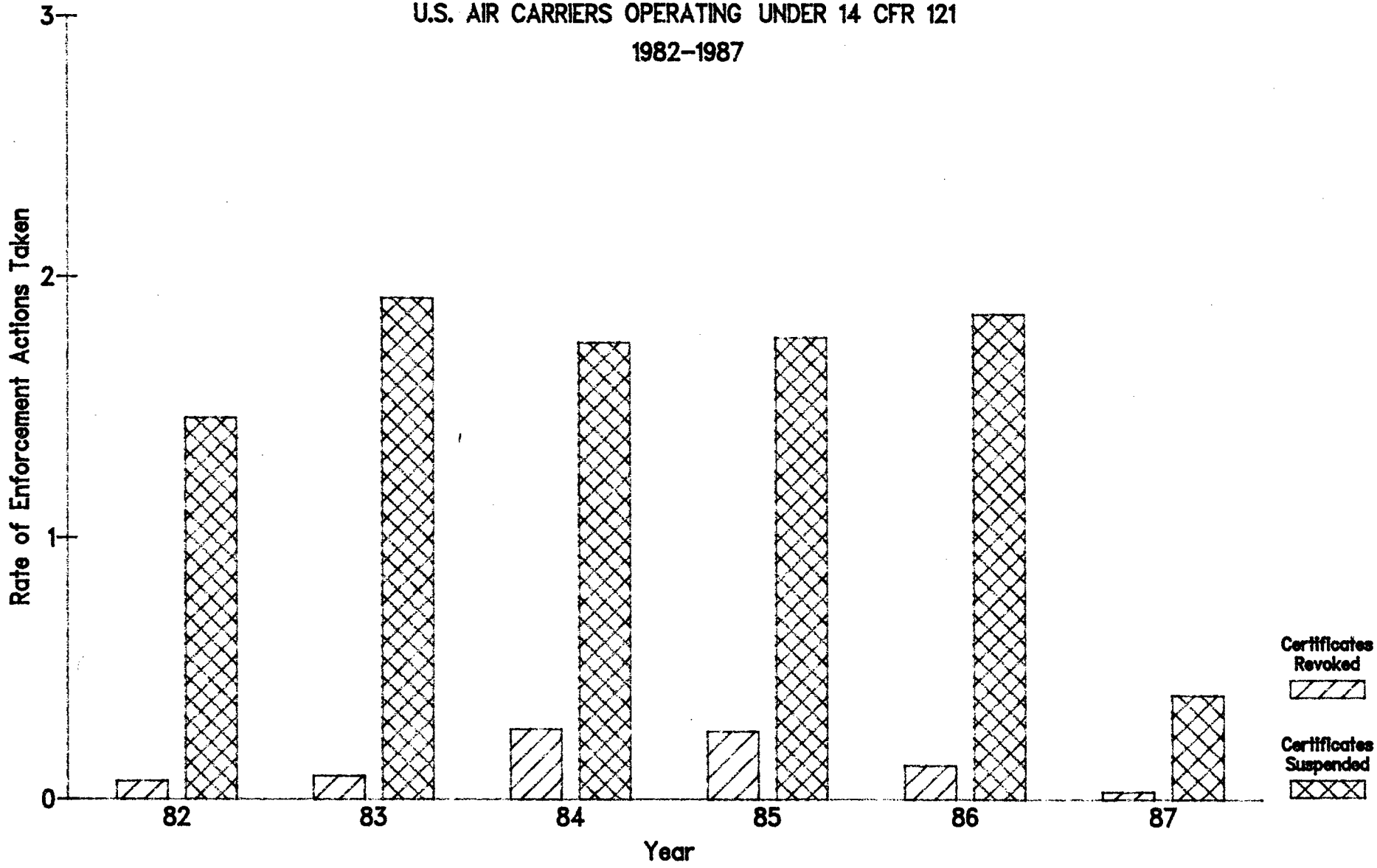
FIGURE 3-9
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF INITIATION
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
1982-1987



See Appendix A, Table 2

Data as of 1-22-88 are preliminary.

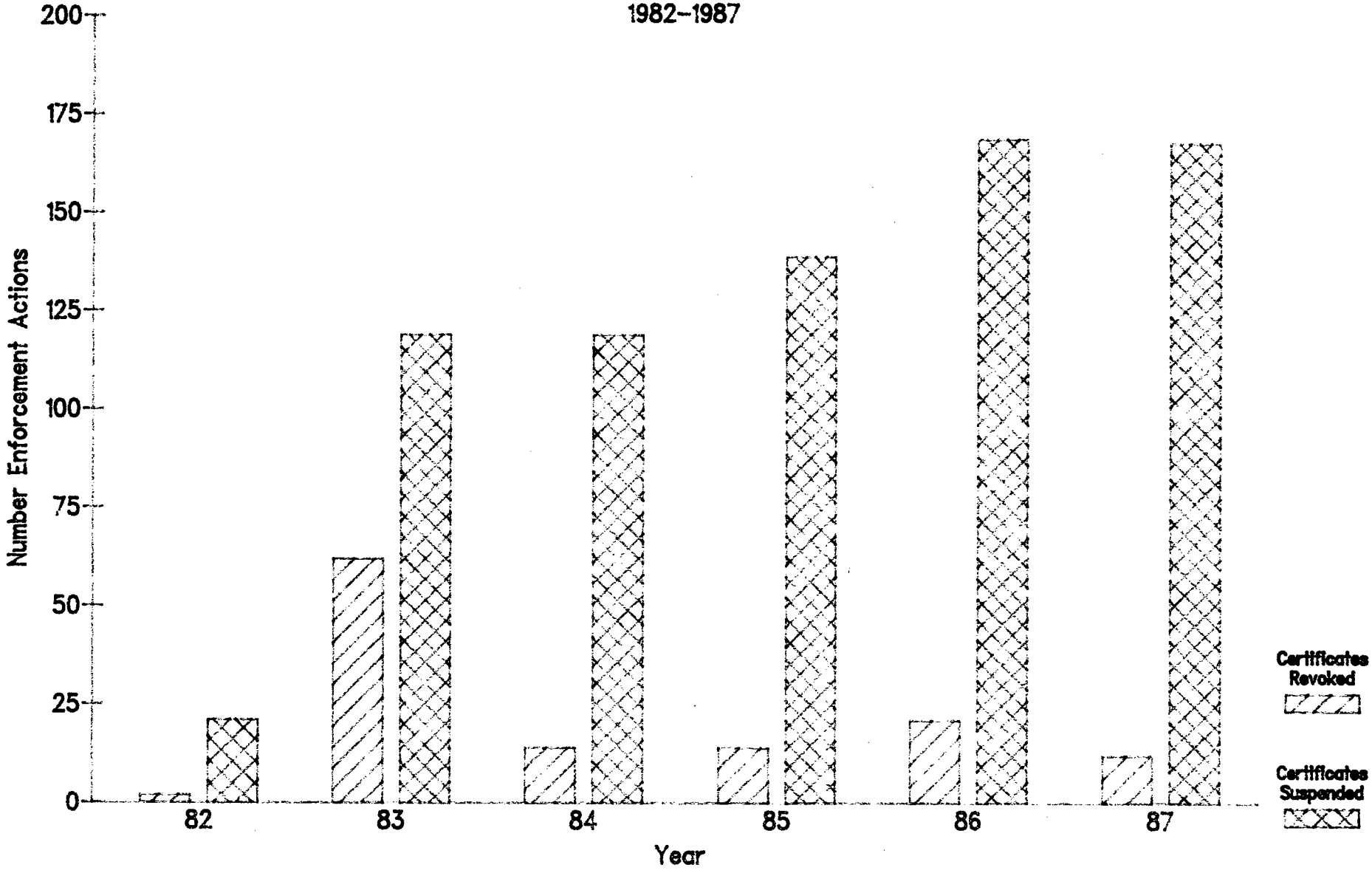
FIGURE 3-10
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF INITIATION
Per 100,000 Aircraft Flight Hours
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
1982–1987



See Appendix A, Table 2

Data as of 1-22-88 are preliminary.

FIGURE 3-11
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF COMPLETION
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
1982-1987



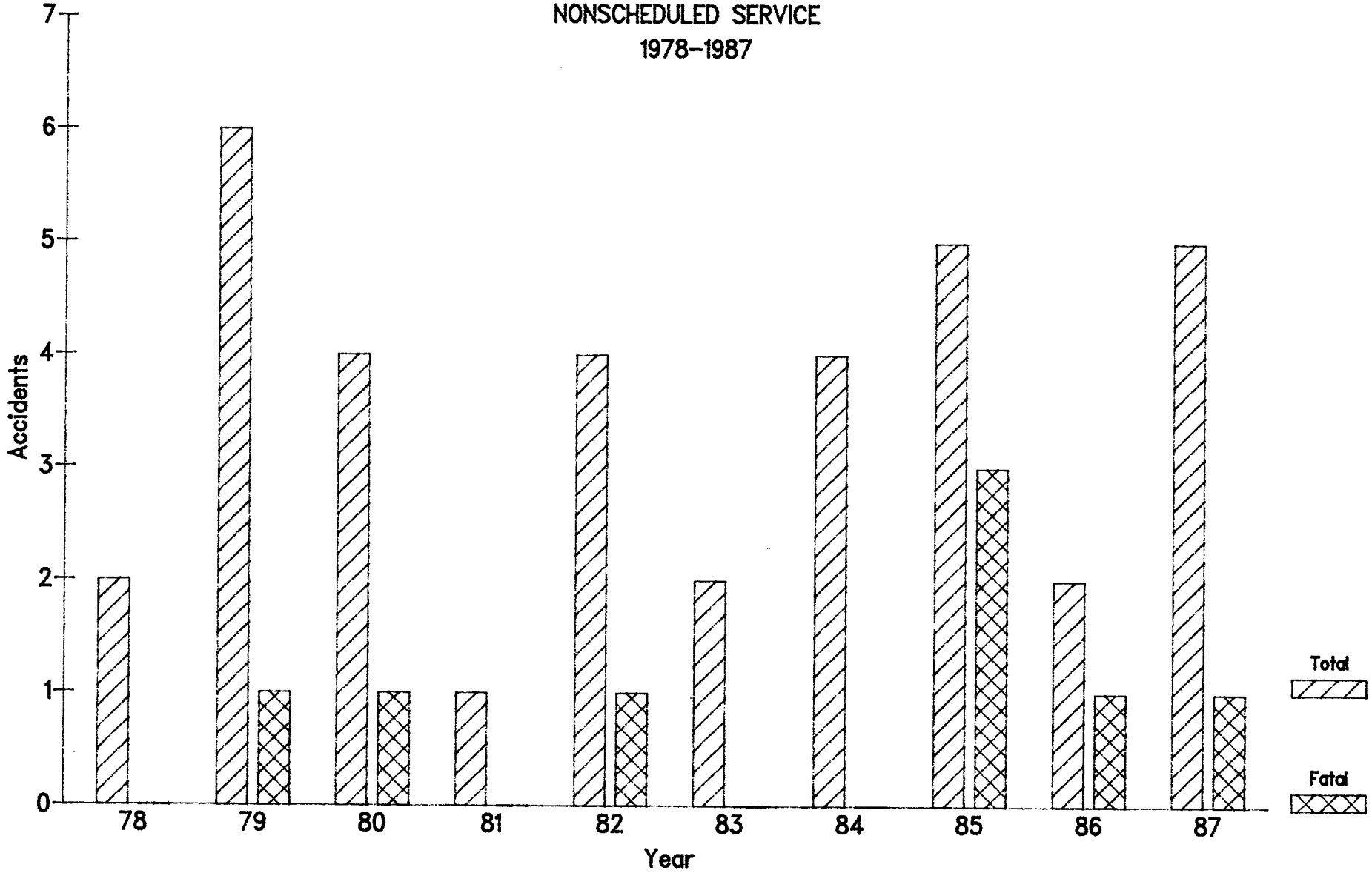
See Appendix A, Table 2

Data as of 1-22-88 are preliminary.

3.2.2 Nonscheduled Service

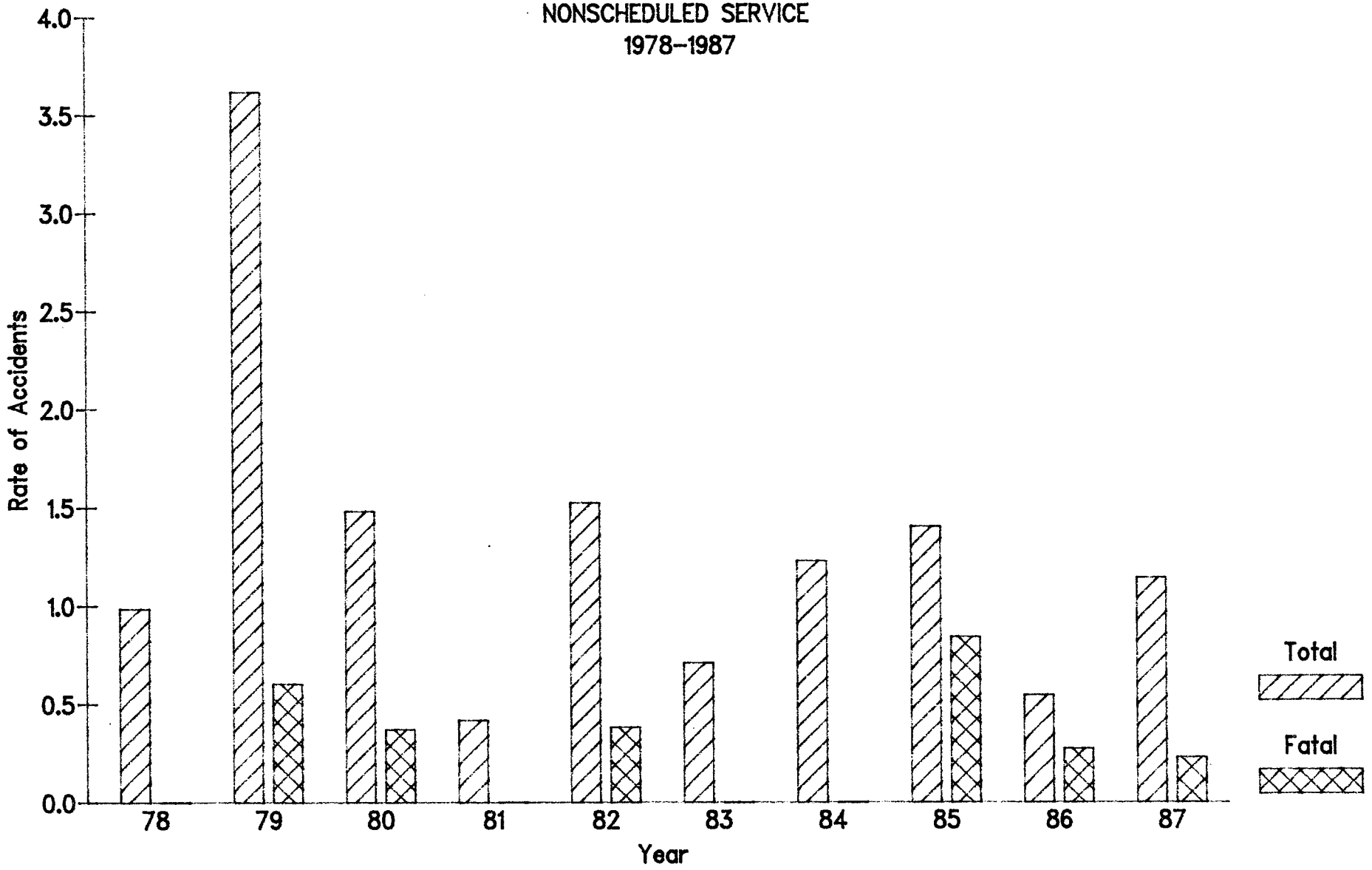
Accident statistics for Part 121 carriers in nonscheduled service are shown in Appendix A, Table 3. In 1987 there were five accidents for this category of service as compared to two accidents in 1978. During the ten-year period starting in 1978, aircraft flight hours have grown by more than 115%. The resultant accident rate shows a slight increase from .99 accidents per 100,000 flight hours in 1978 to 1.14 in 1987. The fatal accident rate of .23 is the lowest rate since 1984 when there were no fatal accidents in this category. There is no current evidence that deregulation has adversely affected the safety levels of Part 121 carriers conducting nonscheduled operations. These data are presented in Figures 3-12 through 3-15.

FIGURE 3-12
ACCIDENTS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 3

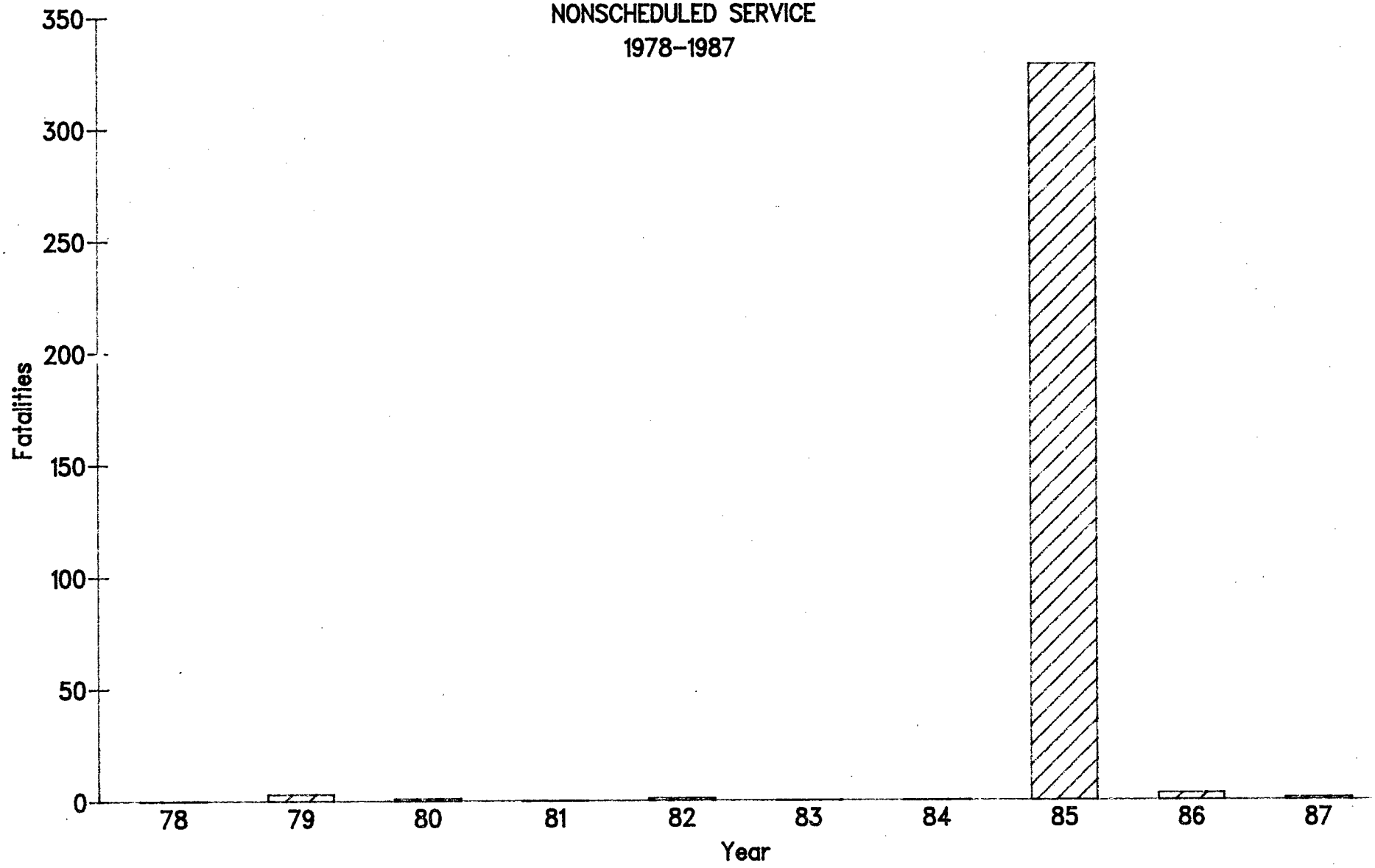
FIGURE 3-13
ACCIDENT RATES
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 3

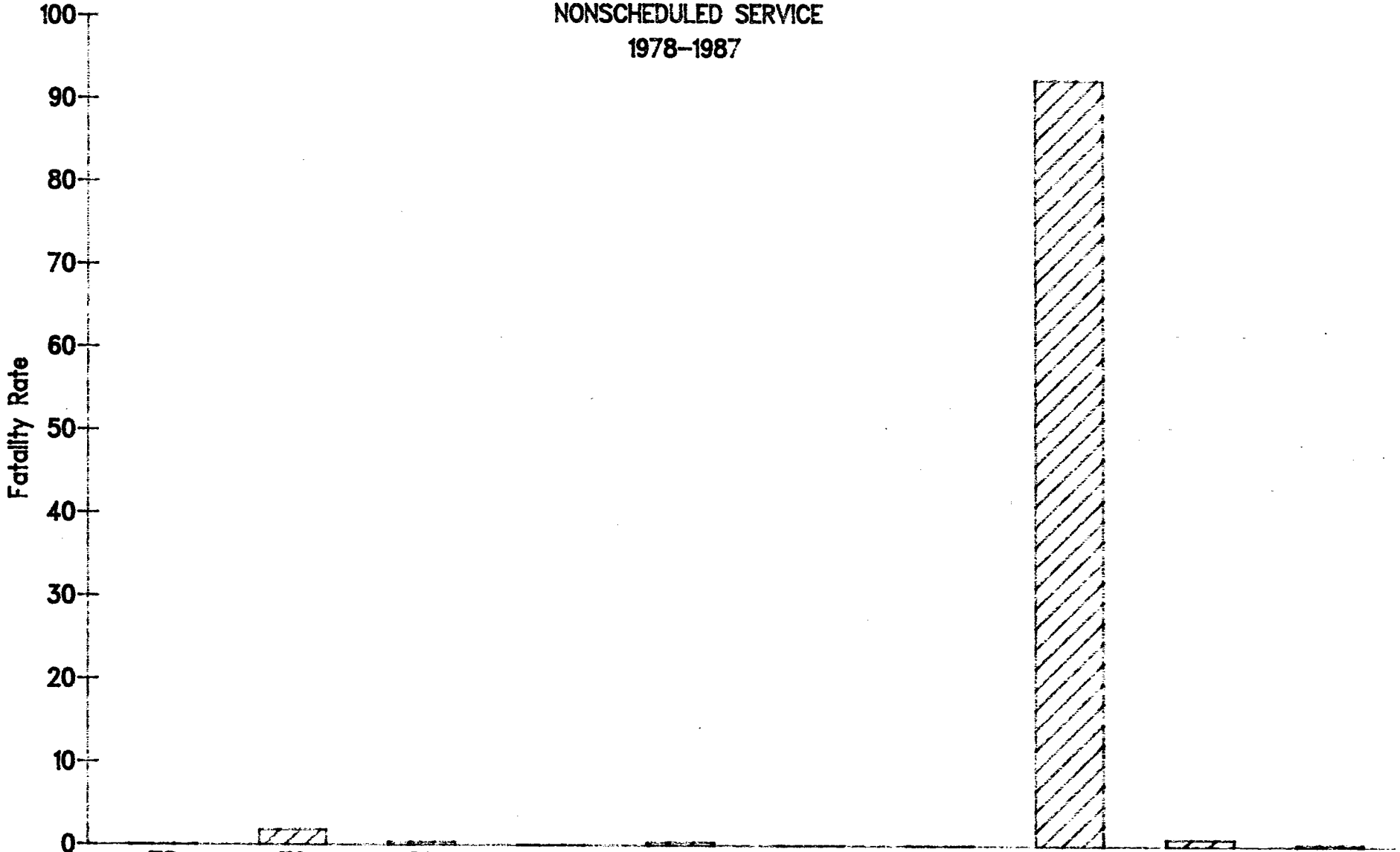
Note: All rates are per 100,000 flight hours.

FIGURE 3-14
FATALITIES
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 3

FIGURE 3-15
FATALITY RATE
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 3

Note: All rates are per 100,000 flight hours.

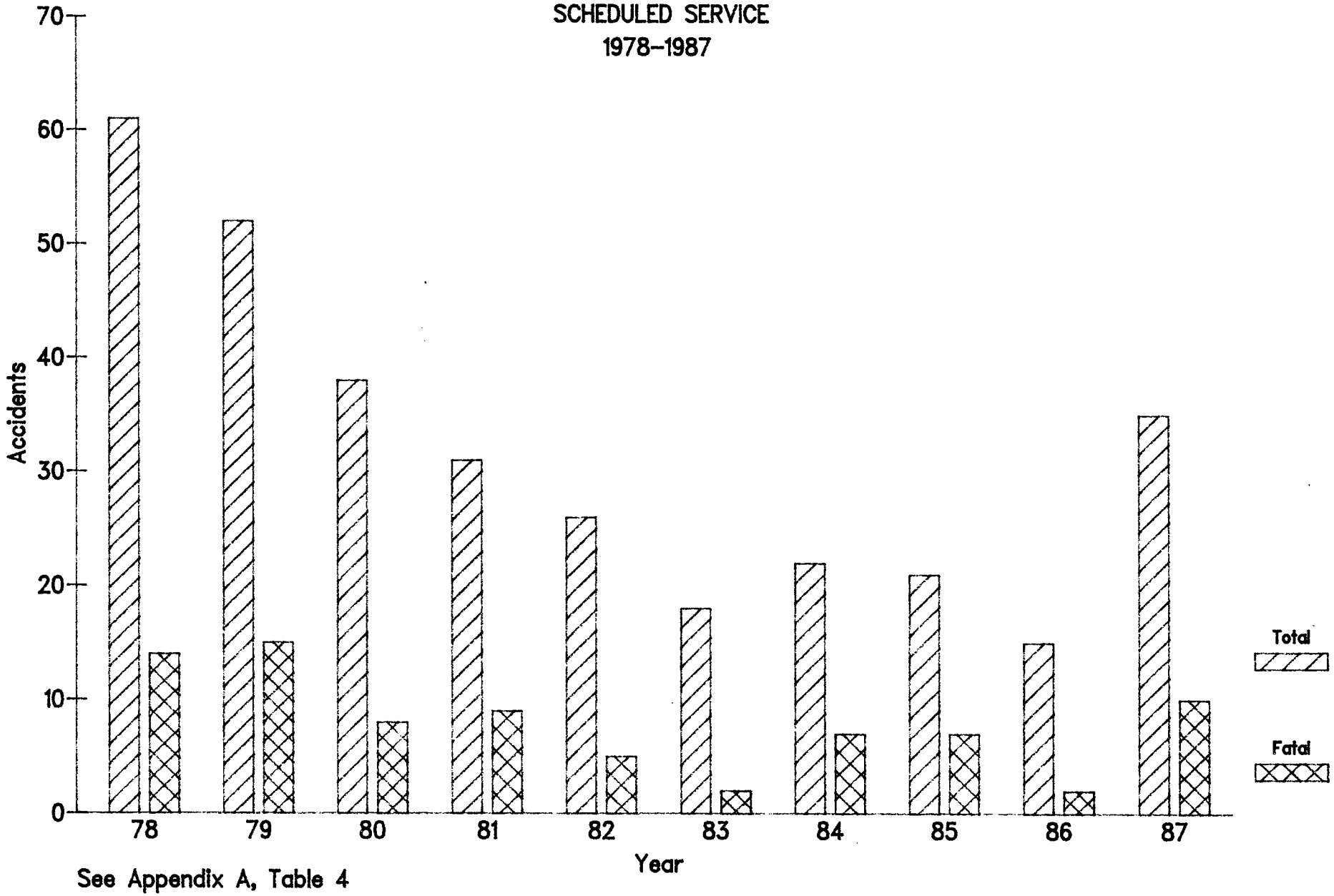
3.3 COMMUTER AIR CARRIERS

Accident and incident statistics for Part 135 commuter air carriers in scheduled service are presented in Appendix A, Table 4. There were 35 commuter air carrier accidents in 1987 corresponding to an accident rate of 2.39 accidents per 100,000 flight hours. The commuter air carrier accident rate has been generally decreasing with the 1987 rate higher than the 1986 rate but lower than the rate for calendar year 1978. The ten fatal accidents and resulting fatality rate of 3.97 fatalities per 100,000 flight hours are the highest figures since 1979. The 1987 incident rate for commuters was 14.50 incidents per 100,000 flight hours, down from 15.88 in 1986. These data are presented in Figures 3-16 through 3-21.

As shown in Appendix A, Table 5, the number and rate of enforcement cases initiated for commuter air carriers in 1987 increased from 1986. The data contained in this table refer to both operating and personnel certificates. The number of cases that resulted in revoked and suspended certificates appear to show declines; however, many 1986 and 1987 cases have not reached final disposition. For enforcement cases, the lag time between case initiation and final disposition makes the data and discussion of recent year trends preliminary. As a result of the time lag between initiation and final disposition of an enforcement case, the numbers of enforcement actions completed in a year can include completion of cases initiated in prior years. The number of revocations and suspensions, as shown in Appendix A, Table 5, have generally increased since 1982. These data are presented in Figures 3-22 through 3-26.

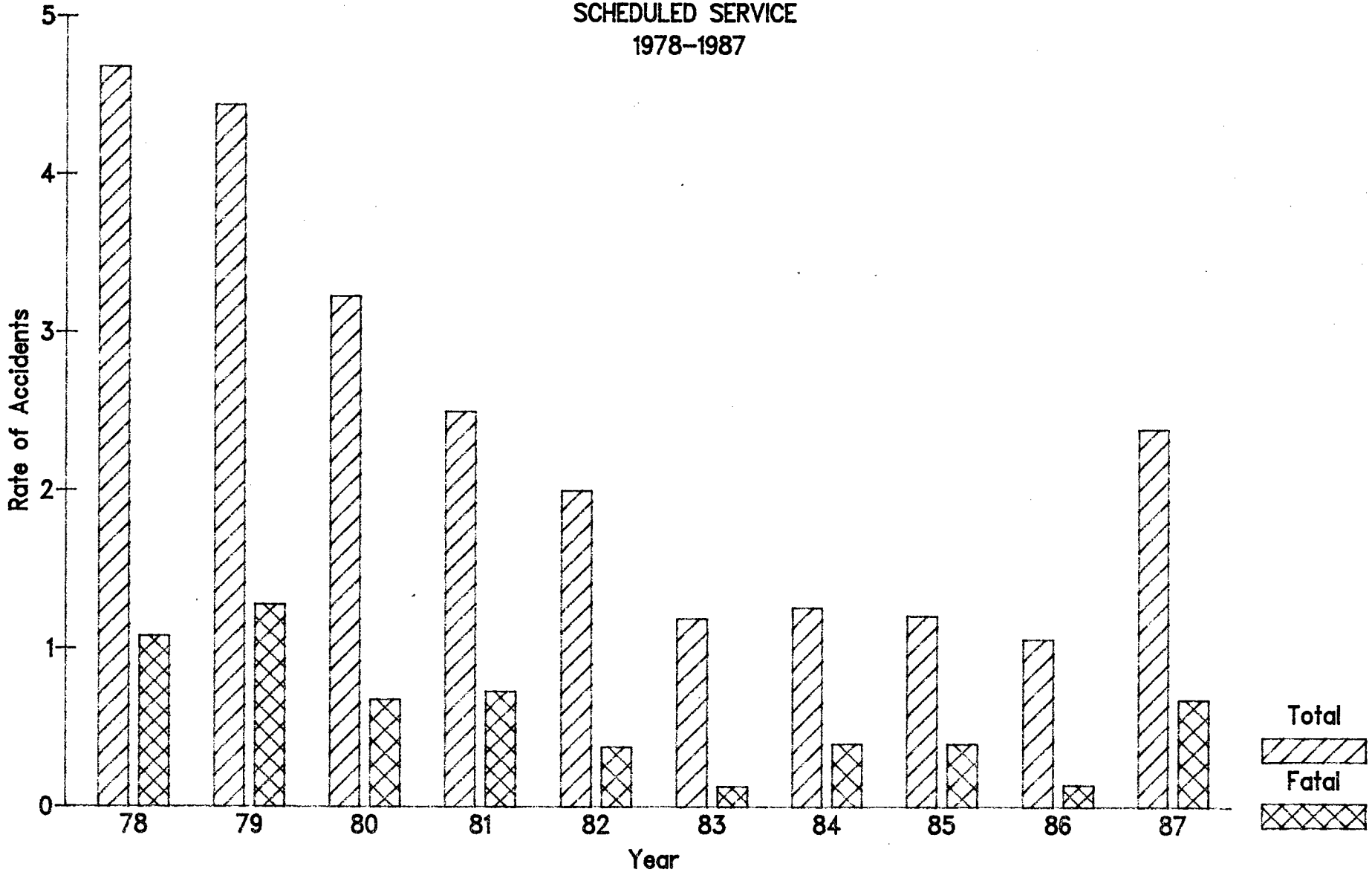
These data show no evidence that deregulation has adversely affected the safety of commuter air carriers in scheduled operations.

FIGURE 3-16
ACCIDENTS
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 4

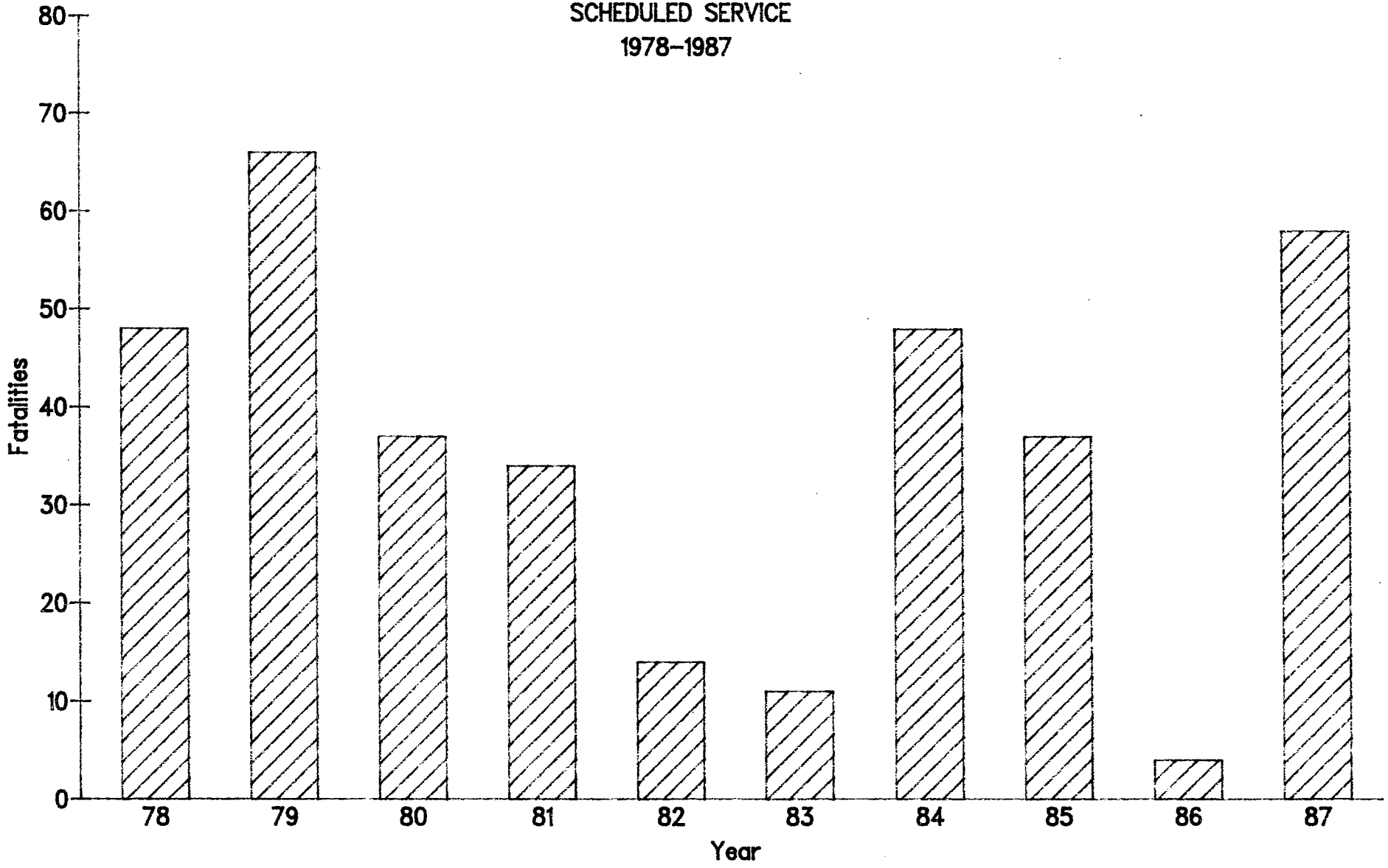
FIGURE 3-17
ACCIDENT RATES
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 4

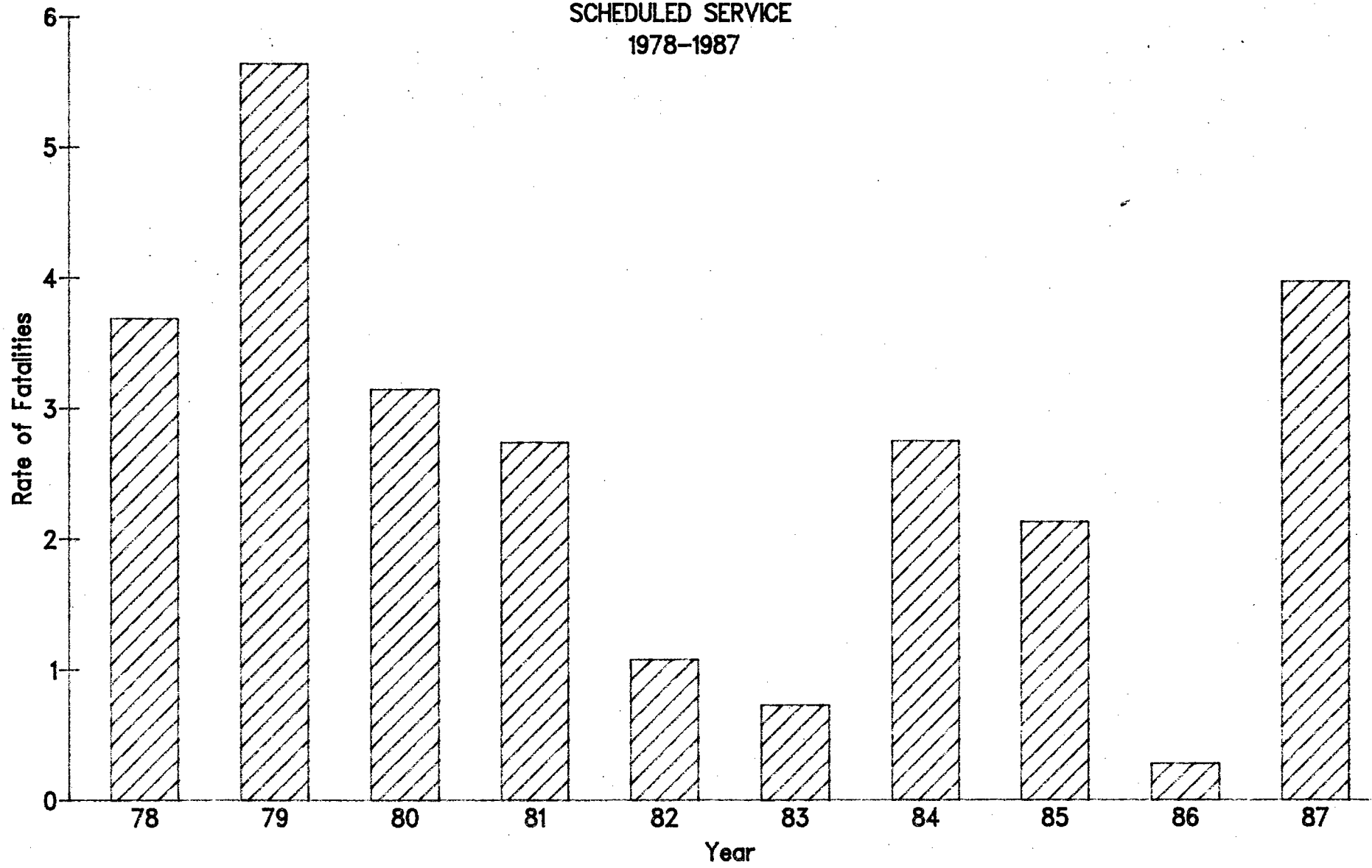
Note: All rates are per 100,000 flight hours.

FIGURE 3-18
FATALITIES
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 4

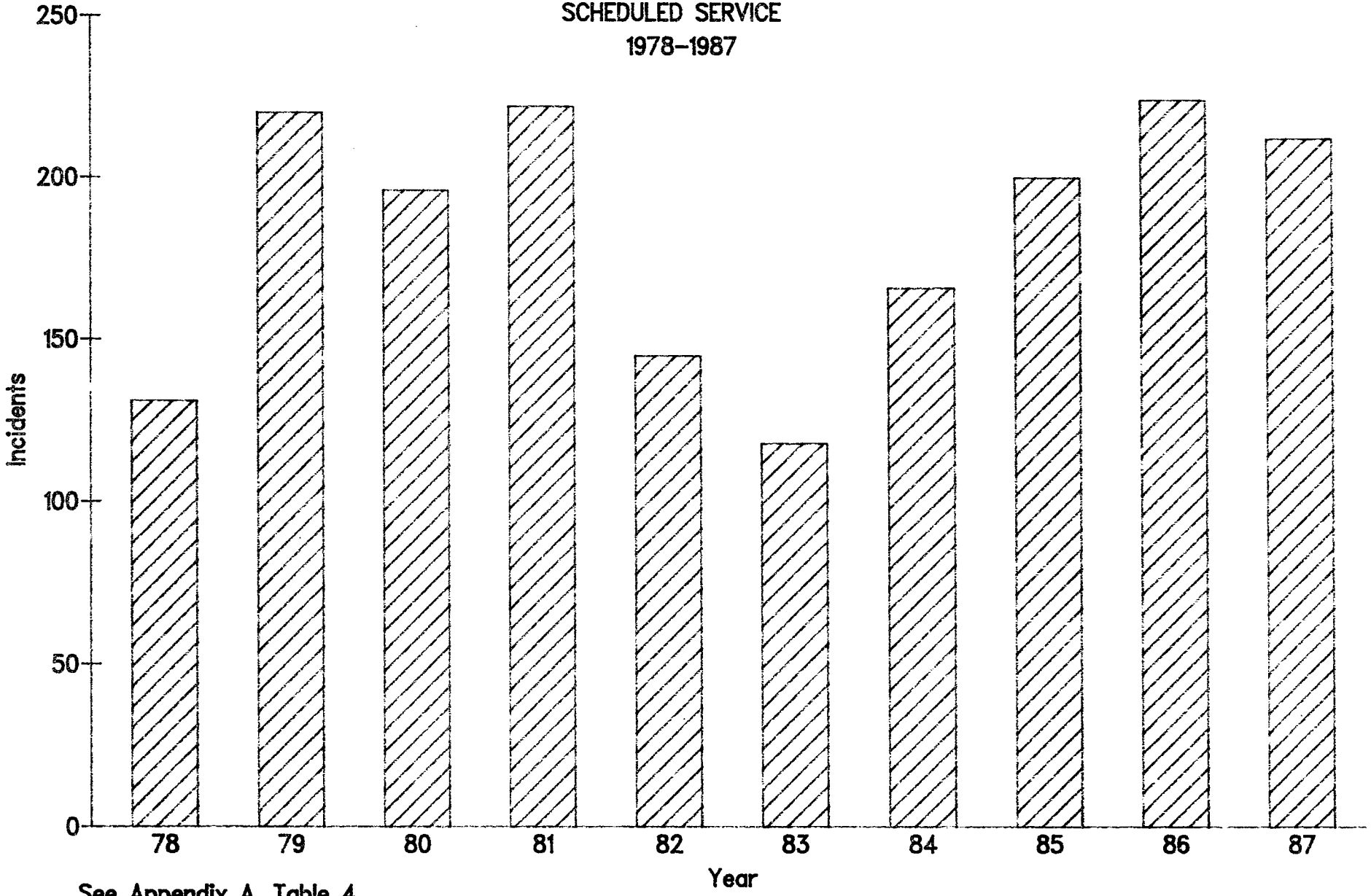
FIGURE 3-19
FATALITY RATES
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 4

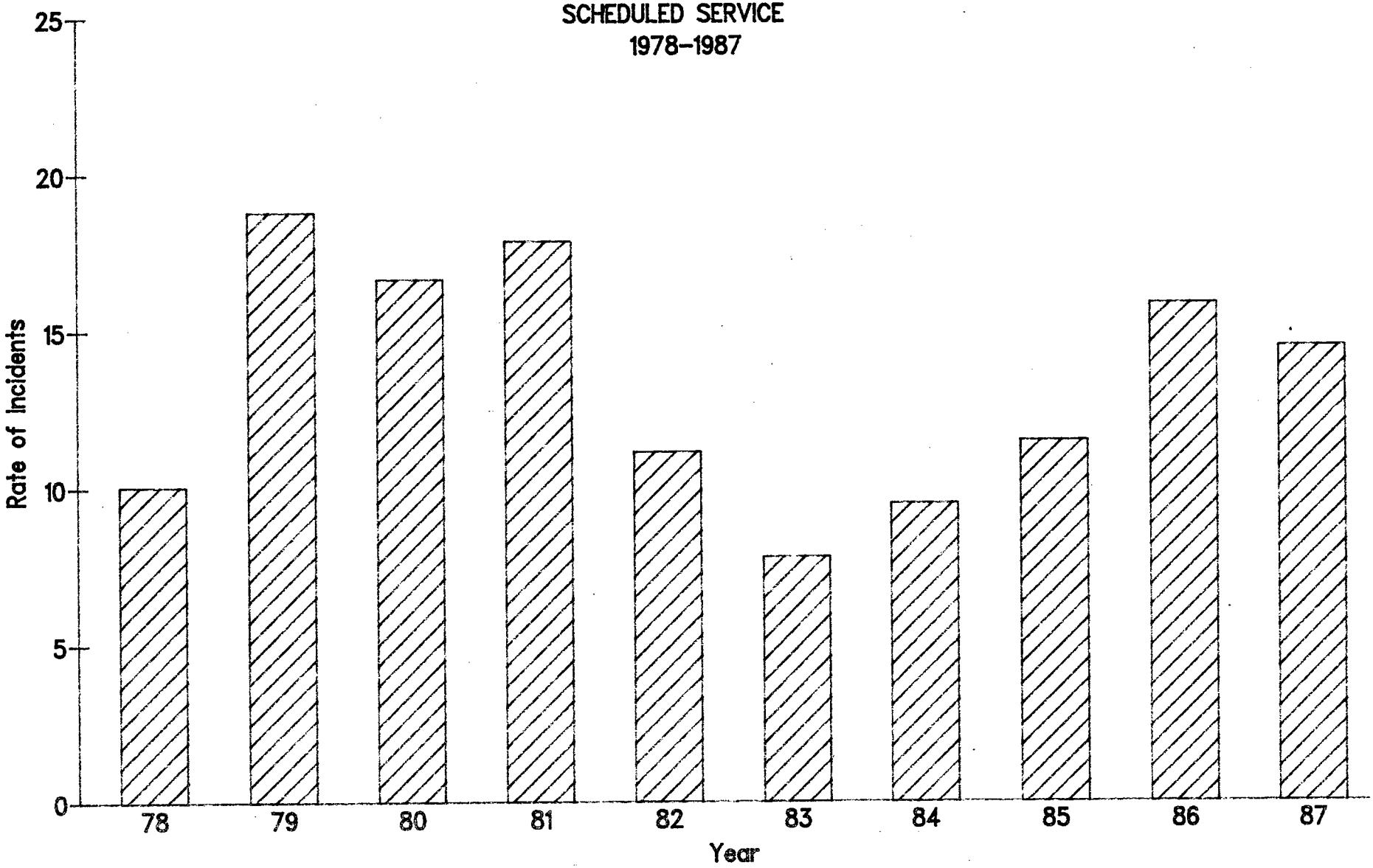
Note: All rates are per 100,000 flight hours.

FIGURE 3-20
INCIDENTS
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 4

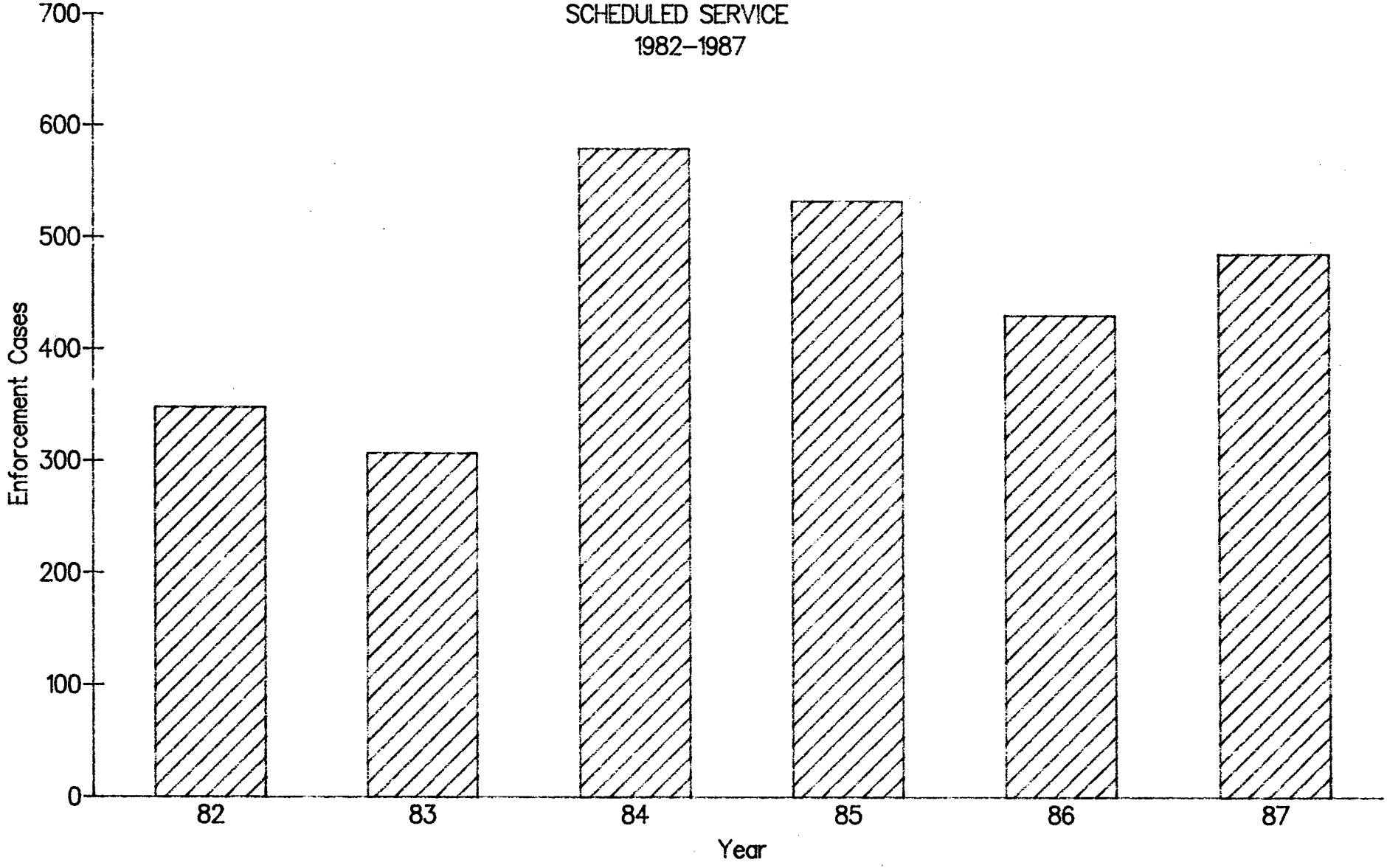
FIGURE 3-21
INCIDENT RATES
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1978-1987



See Appendix A, Table 4

Note: All rates are per 100,000 flight hours.

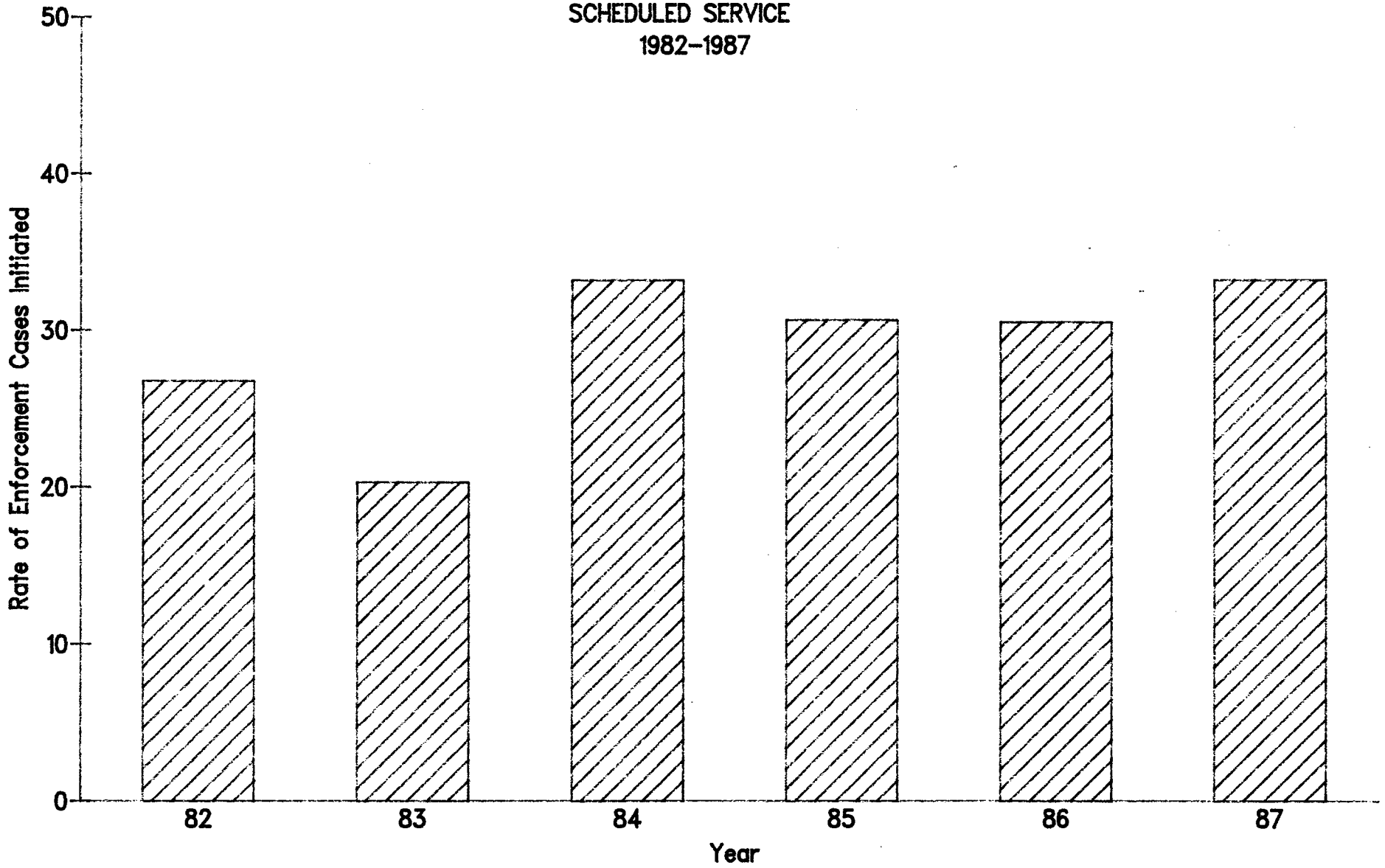
FIGURE 3-22
ENFORCEMENT CASES INITIATED
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1982-1987



See Appendix A, Table 7

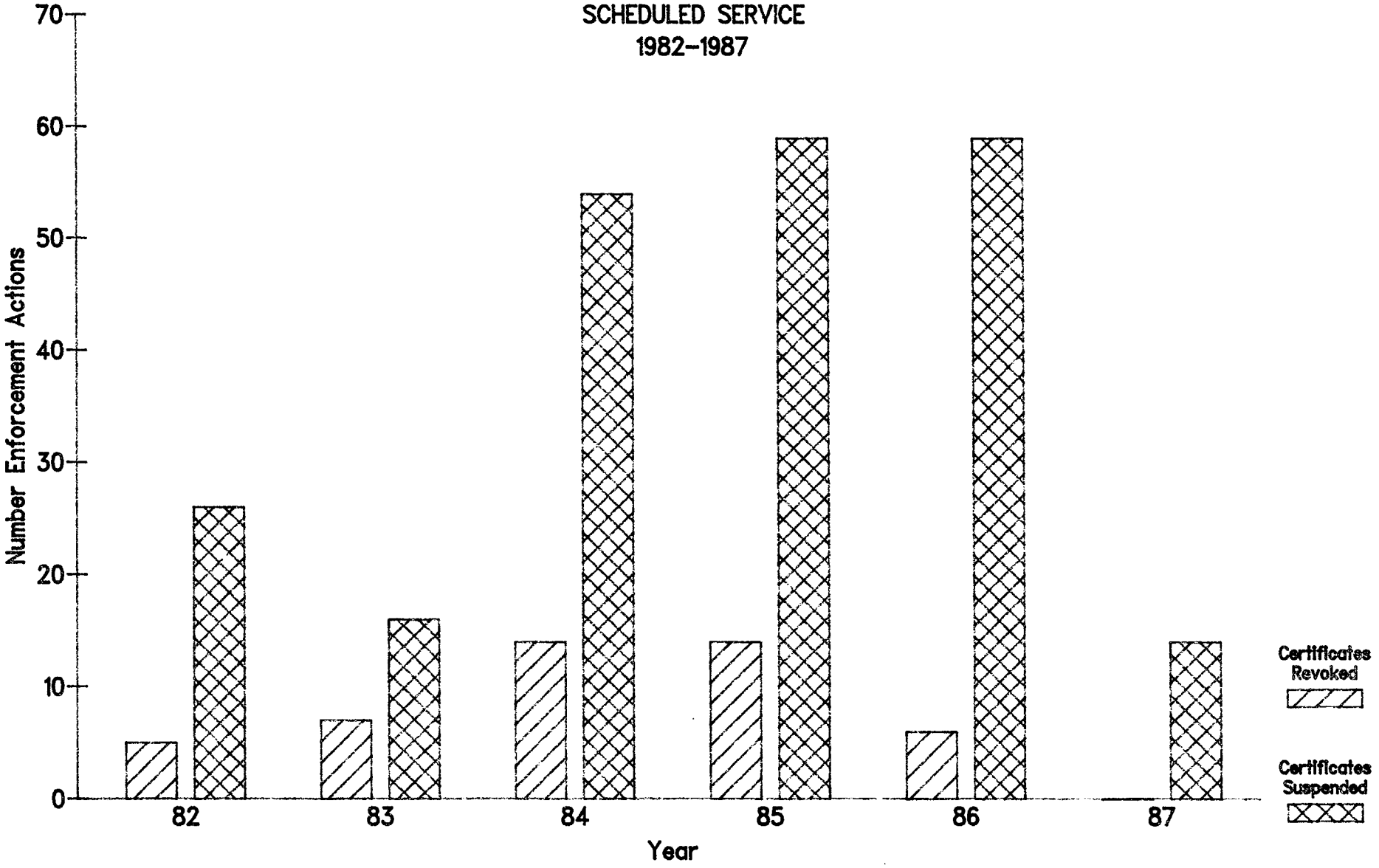
Data as of 1-22-88 are preliminary.

FIGURE 3-23
RATE OF ENFORCEMENT CASES INITIATED
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1982-1987



See Appendix A, Table 5 Data as of 1-22-88 are preliminary. Note: All rates are per 100,000 flight hours.

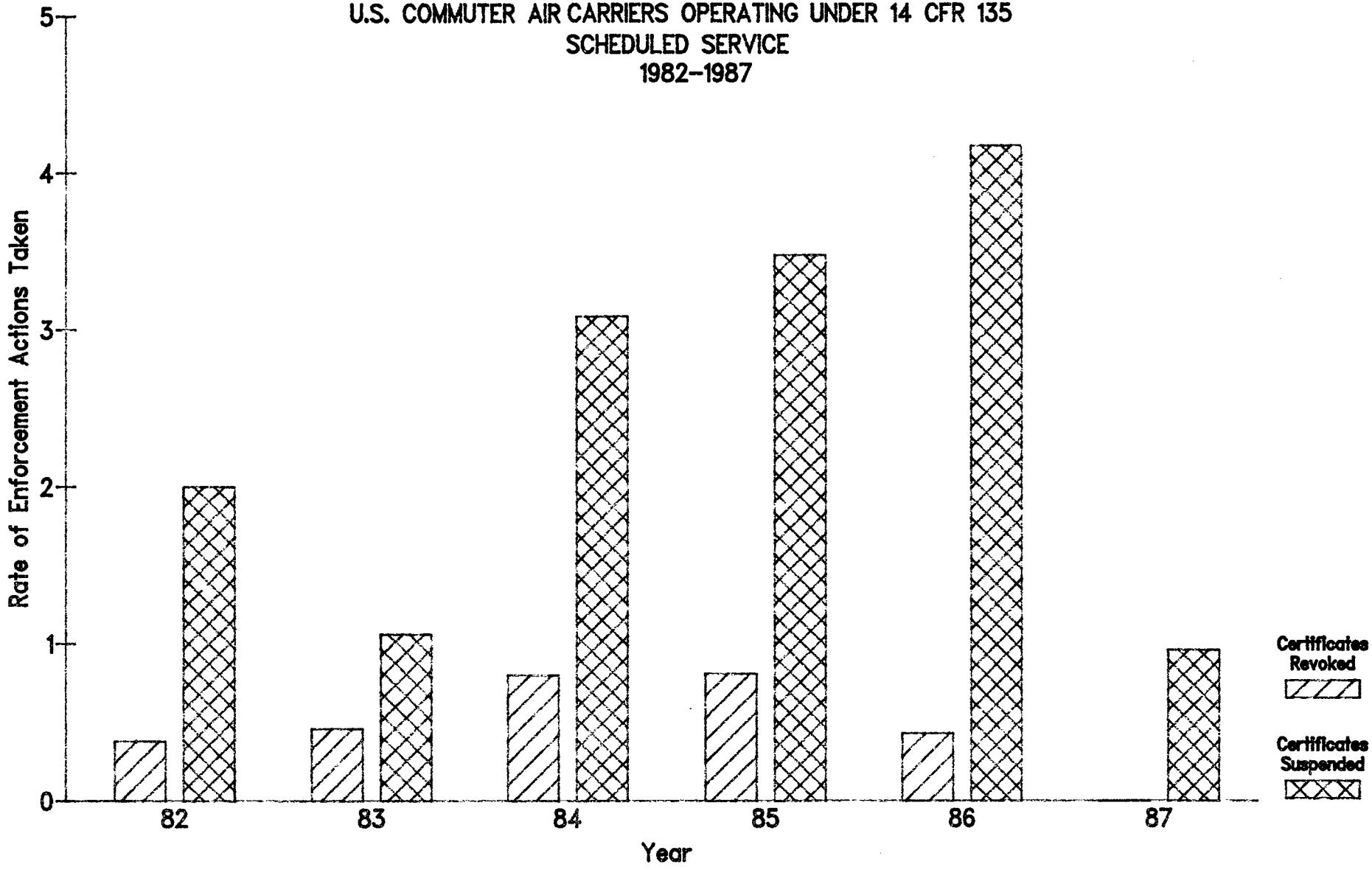
FIGURE 3-24
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF INITIATION
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1982-1987



See Appendix A, Table 5

Data as of 1-22-88 are preliminary.

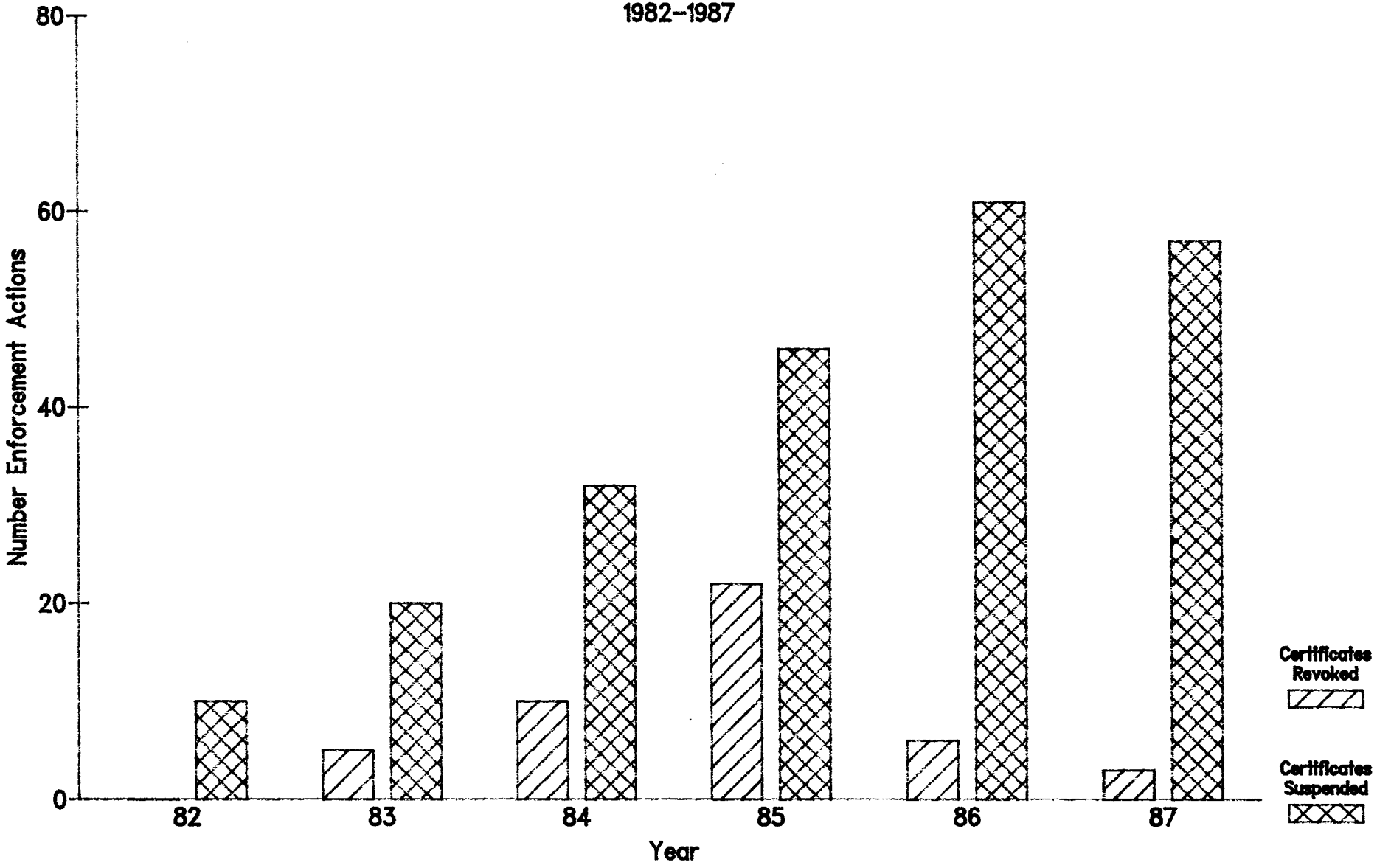
FIGURE 3-25
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF INITIATION
Per 100,000 Aircraft Flight Hours
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1982-1987



See Appendix A, Table 5

Data as of 1-22-88 are preliminary.

FIGURE 3-26
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF COMPLETION
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
1982-1987



See Appendix A, Table 5

Data as of 1-22-88 are preliminary.

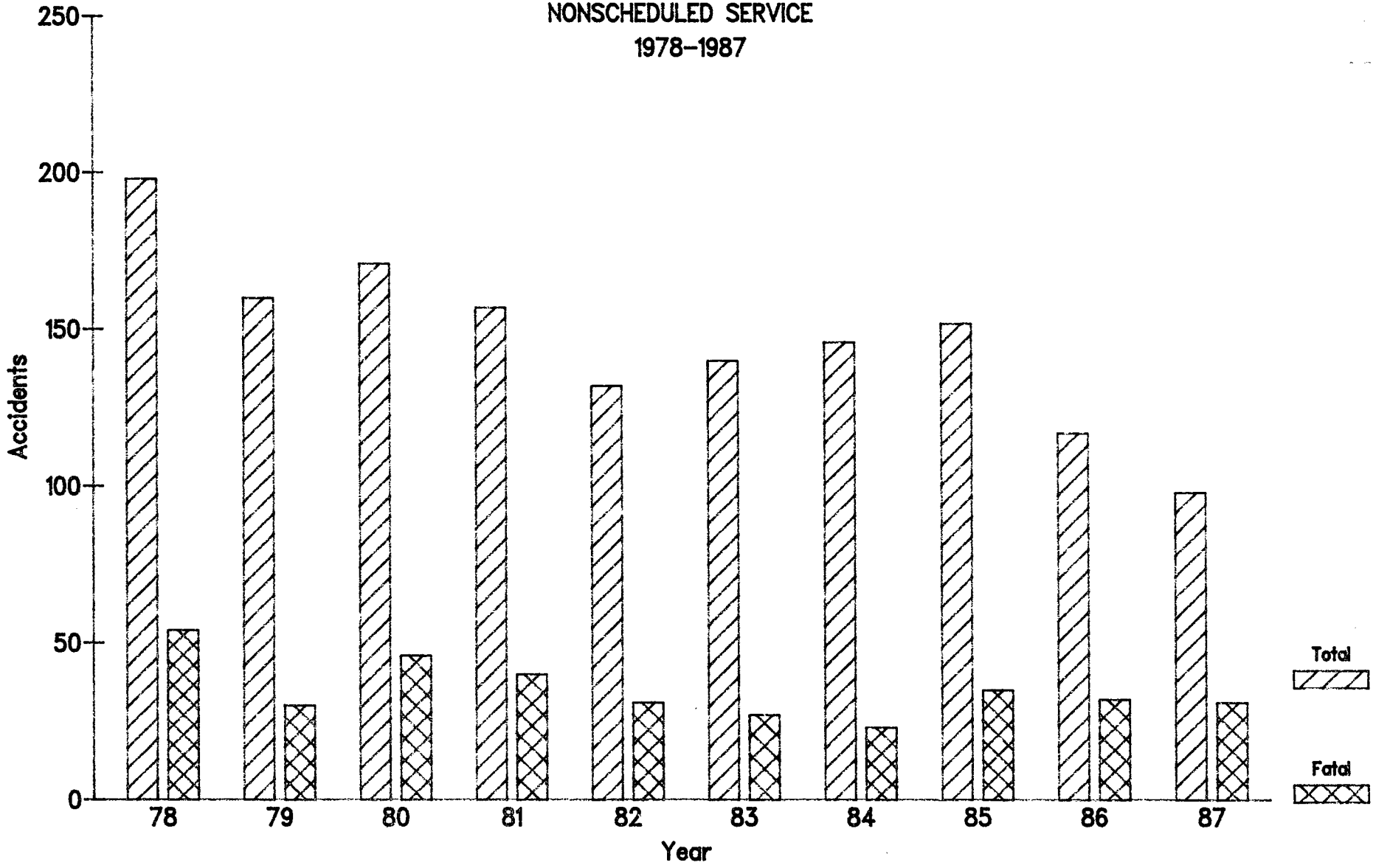
3.4 ON-DEMAND AIR TAXIS

Accident and incident statistics for Part 135 on-demand air taxis (nonscheduled service) are presented in Appendix A, Table 6. The on-demand air taxi accident rate for 1987 is 3.38 accidents per 100,000 flight hours, which is a 39% decrease from the 1978 rate of 5.58. The fatal accident rate of 1.52 fatal accidents per 100,000 flight hours in 1978 has decreased by 30% to 1.07 in 1987. The fatality rate of 4.37 fatalities per 100,000 flight hours in 1978 has decreased by 46% to a 1987 rate of 2.34. The on-demand air taxi incident rate of 11.03 incidents per 100,000 flight hours in 1987 has decreased by 19% from the 1986 rate of 13.59. These data are presented in Figures 3-27 through 3-32.

As shown in Appendix A, Table 7, the number and rate of enforcement cases initiated for air taxis in 1987 decreased from 1986. The data contained in this table refers to both operating and personnel certificates. The numbers of cases that resulted in revoked and suspended certificates show similar declines, although many 1986 and 1987 cases may have yet to reach final disposition. The numbers of enforcement actions completed in a given year can include completion of cases initiated in prior years. These numbers of revocations and suspensions have steadily increased since 1982. These data are presented in Figures 3-33 through 3-37.

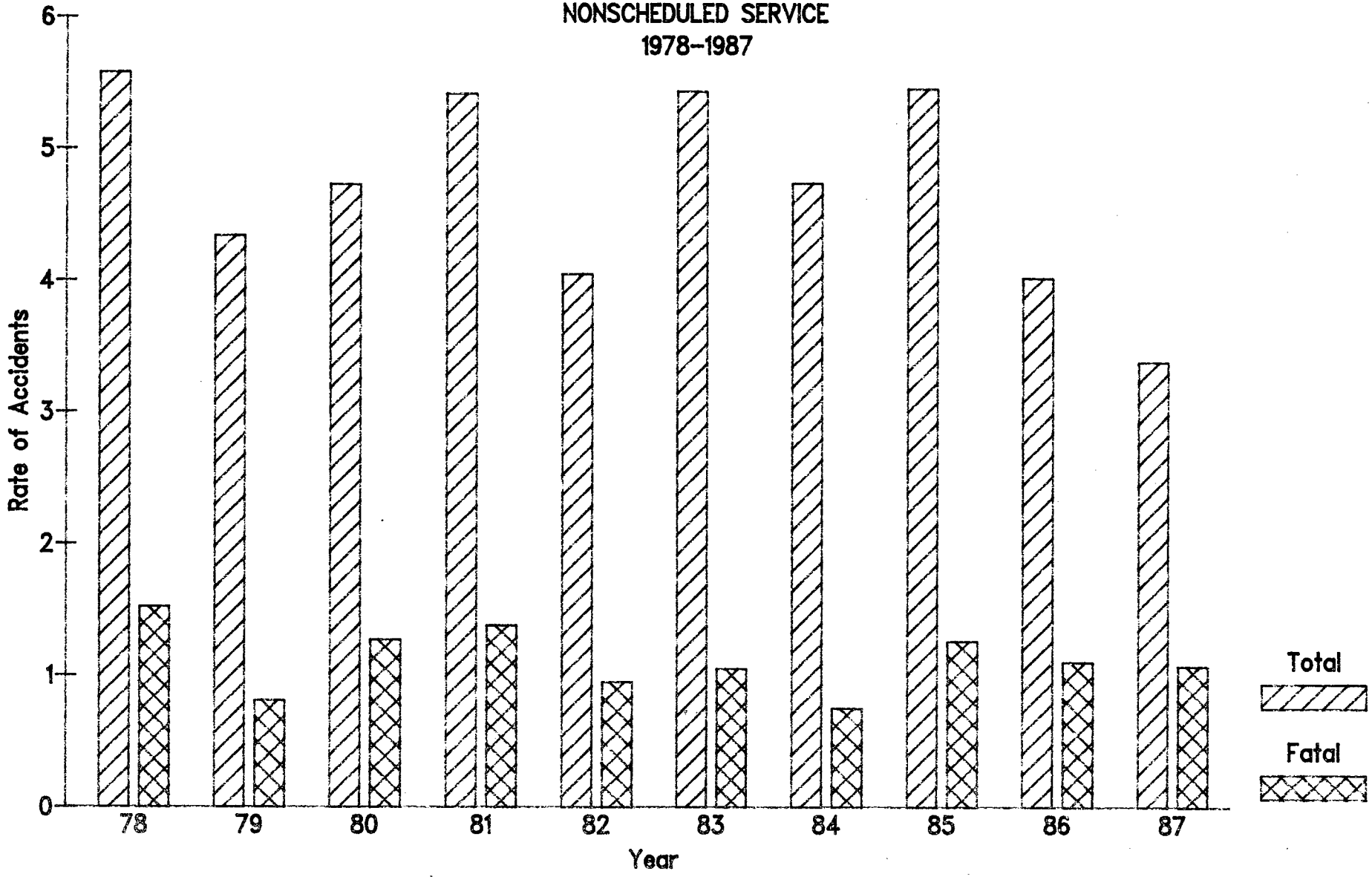
These data show no evidence that deregulation has adversely affected the safety of on-demand air taxi operators.

FIGURE 3-27
ACCIDENTS
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 6

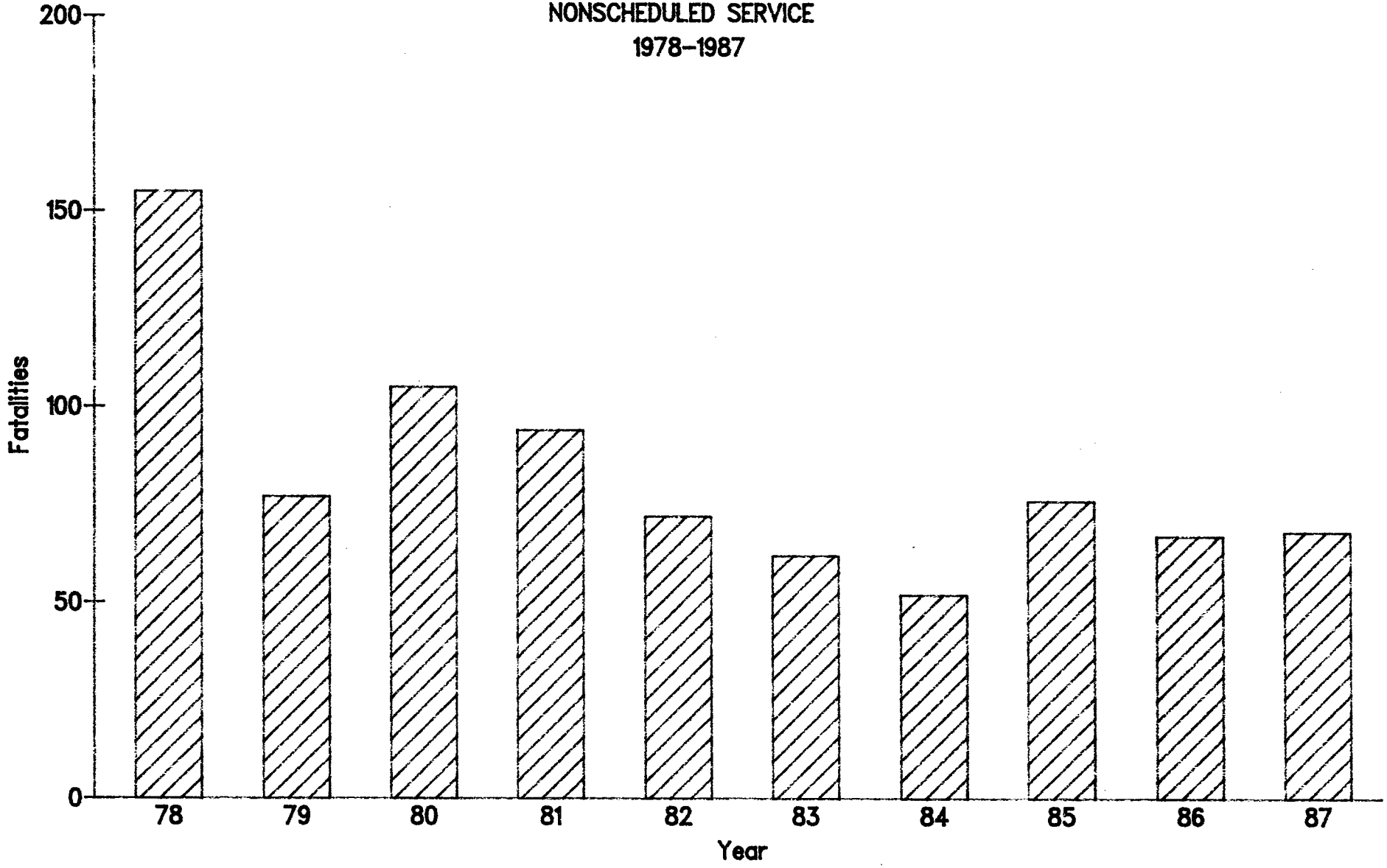
FIGURE 3-28
ACCIDENT RATES
U.S. ON DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 6

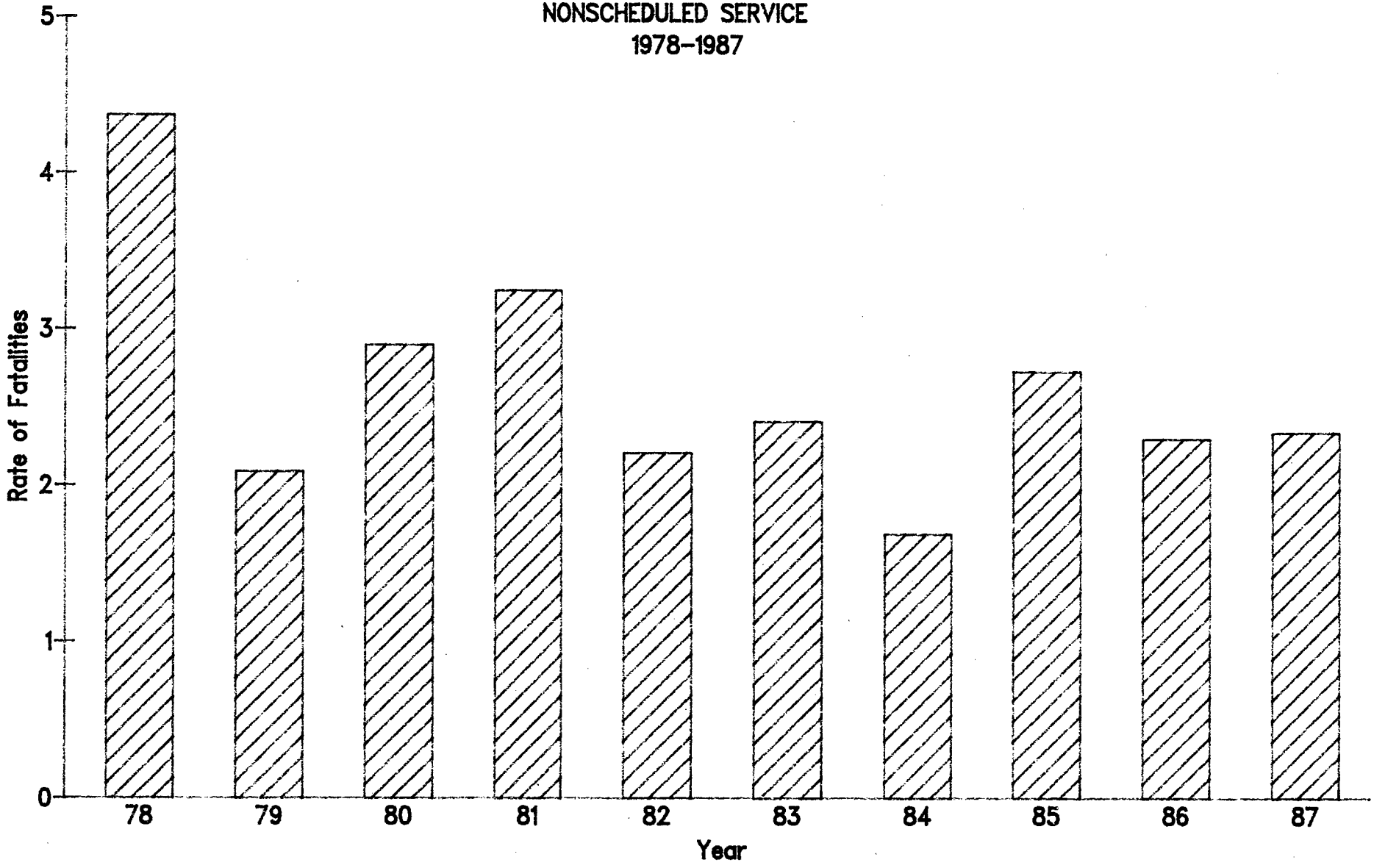
Note: All rates are per 100,000 flight hours.

FIGURE 3-29
FATALITIES
U.S. ON-DEMAND AIR TAXIES OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 6

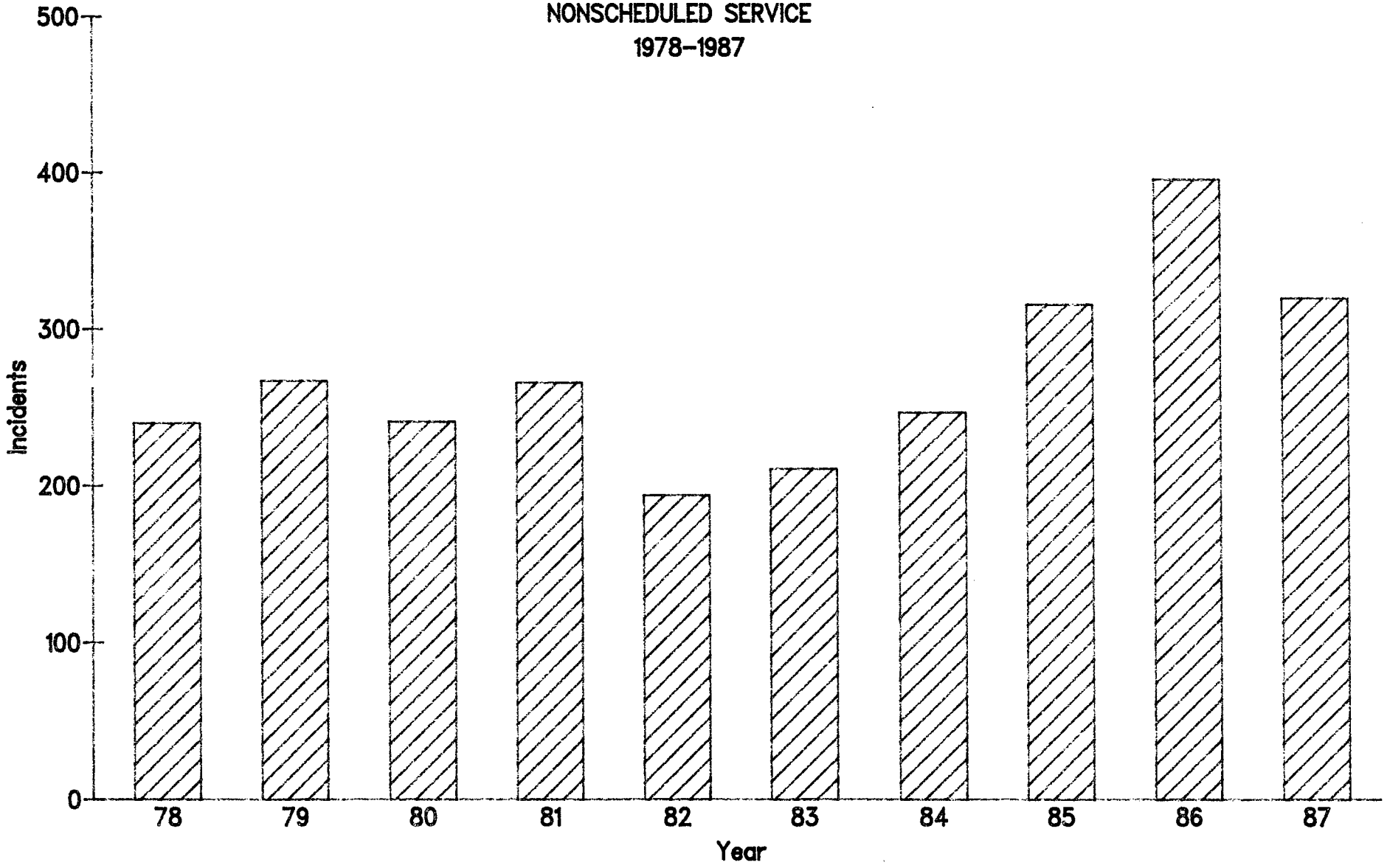
FIGURE 3-30
FATALITY RATES
U.S. ON-DEMAND AIR TAXIES OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 6

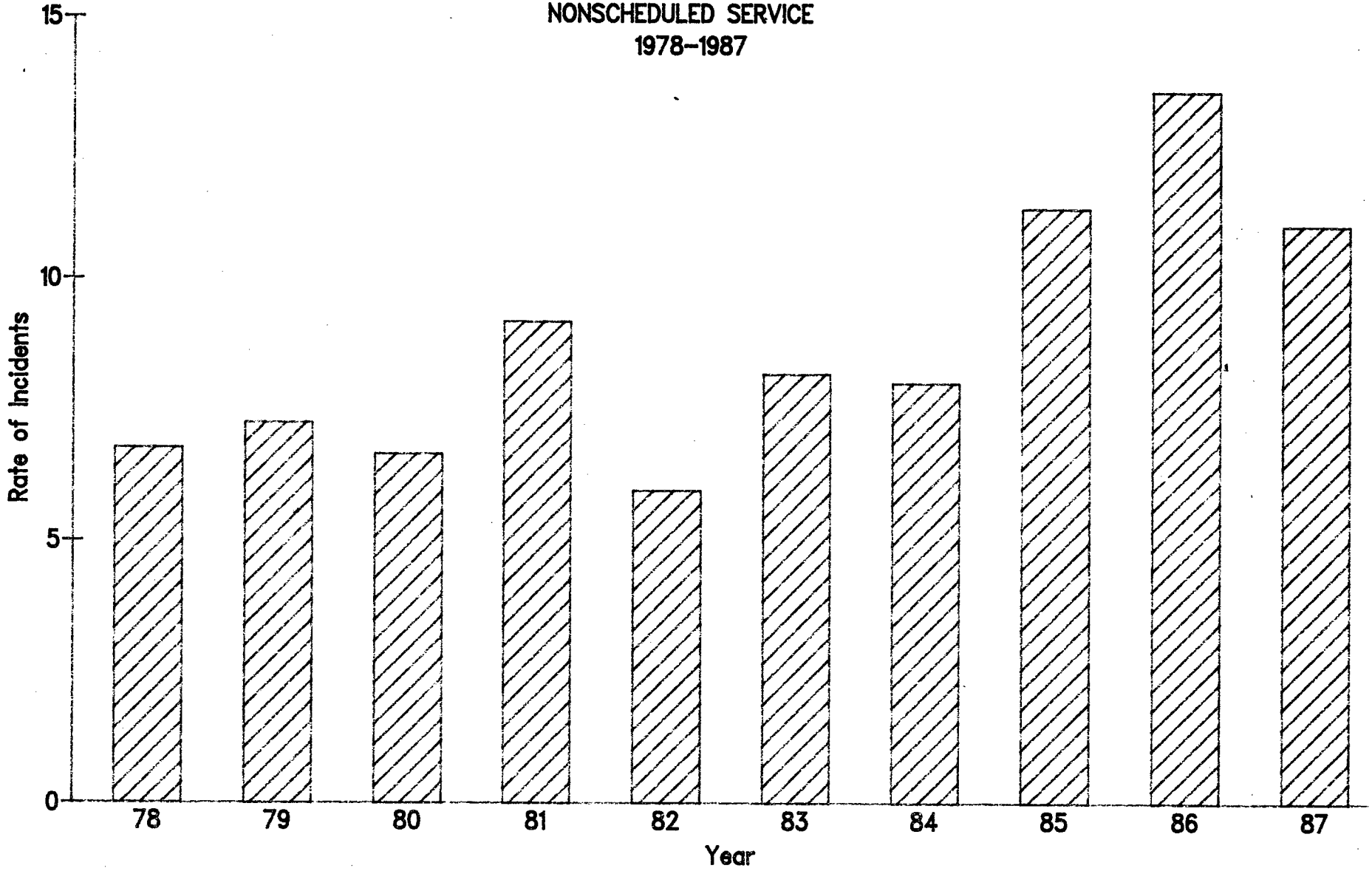
Note: All rates are per 100,000 flight hours.

FIGURE 3-31
INCIDENTS
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 6

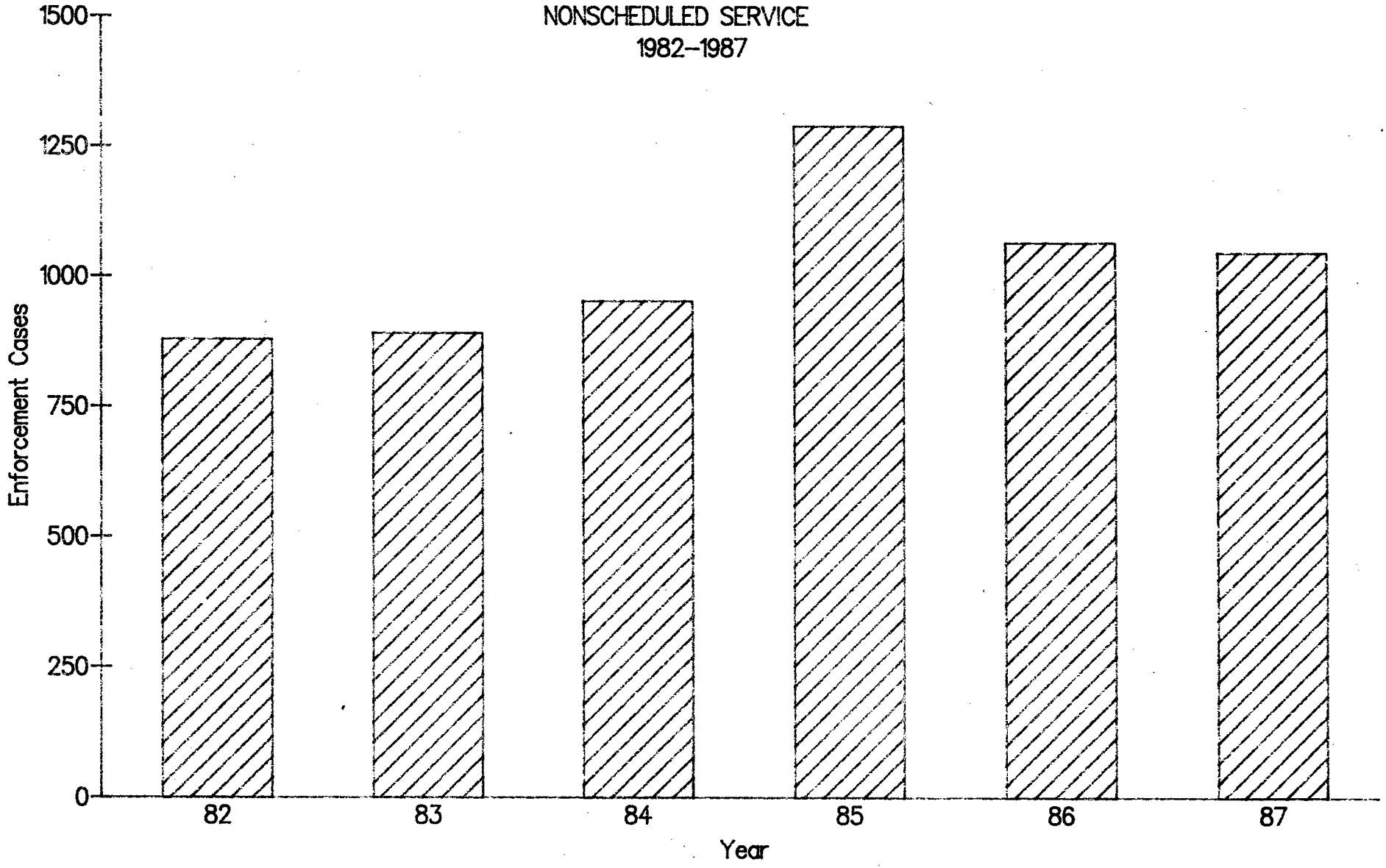
FIGURE 3-32
INCIDENT RATES
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1978-1987



See Appendix A, Table 6

Note: All rates are per 100,000 flight hours

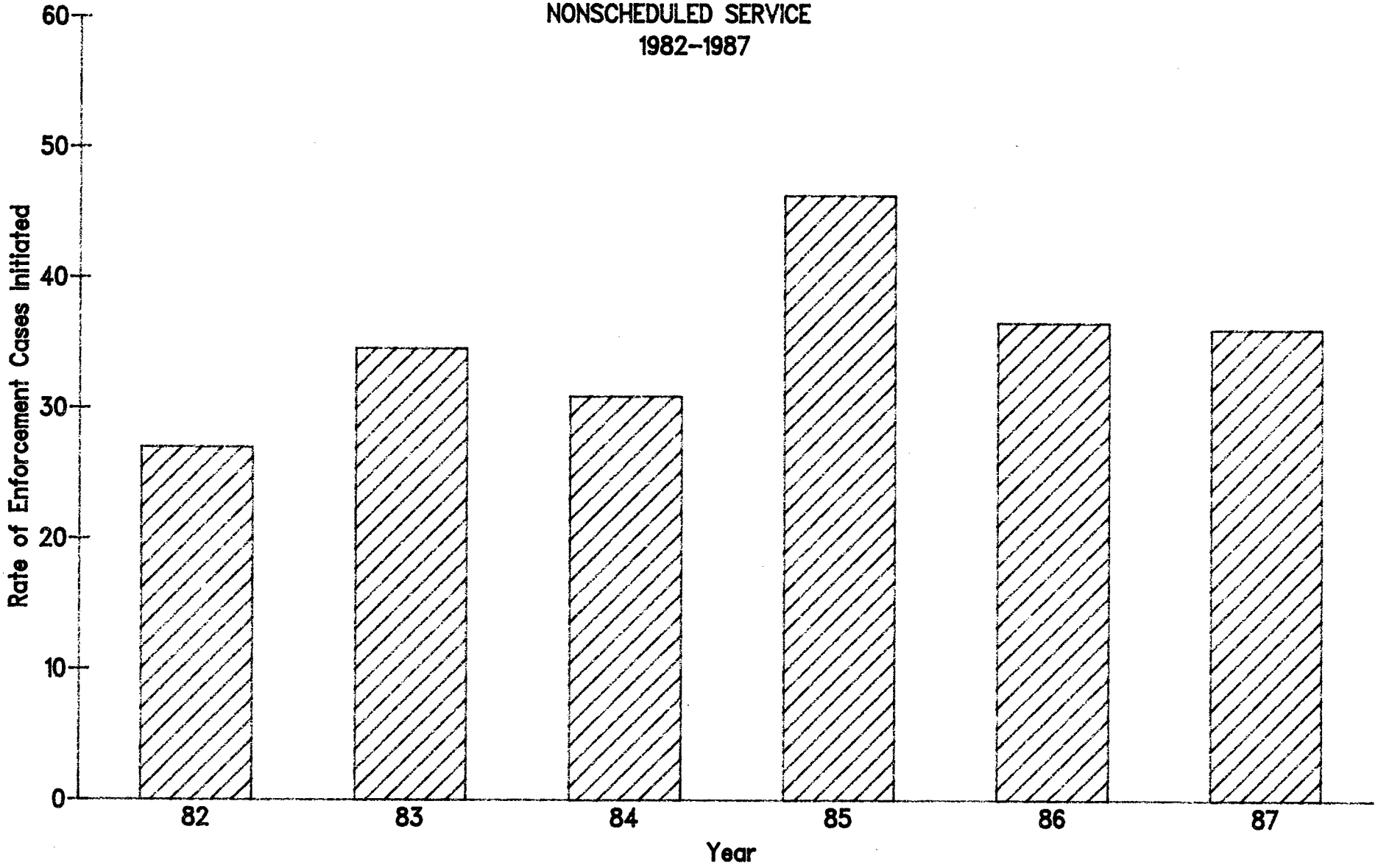
FIGURE 3-33
ENFORCEMENT CASES INITIATED
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1982-1987



See Appendix A, Table 7

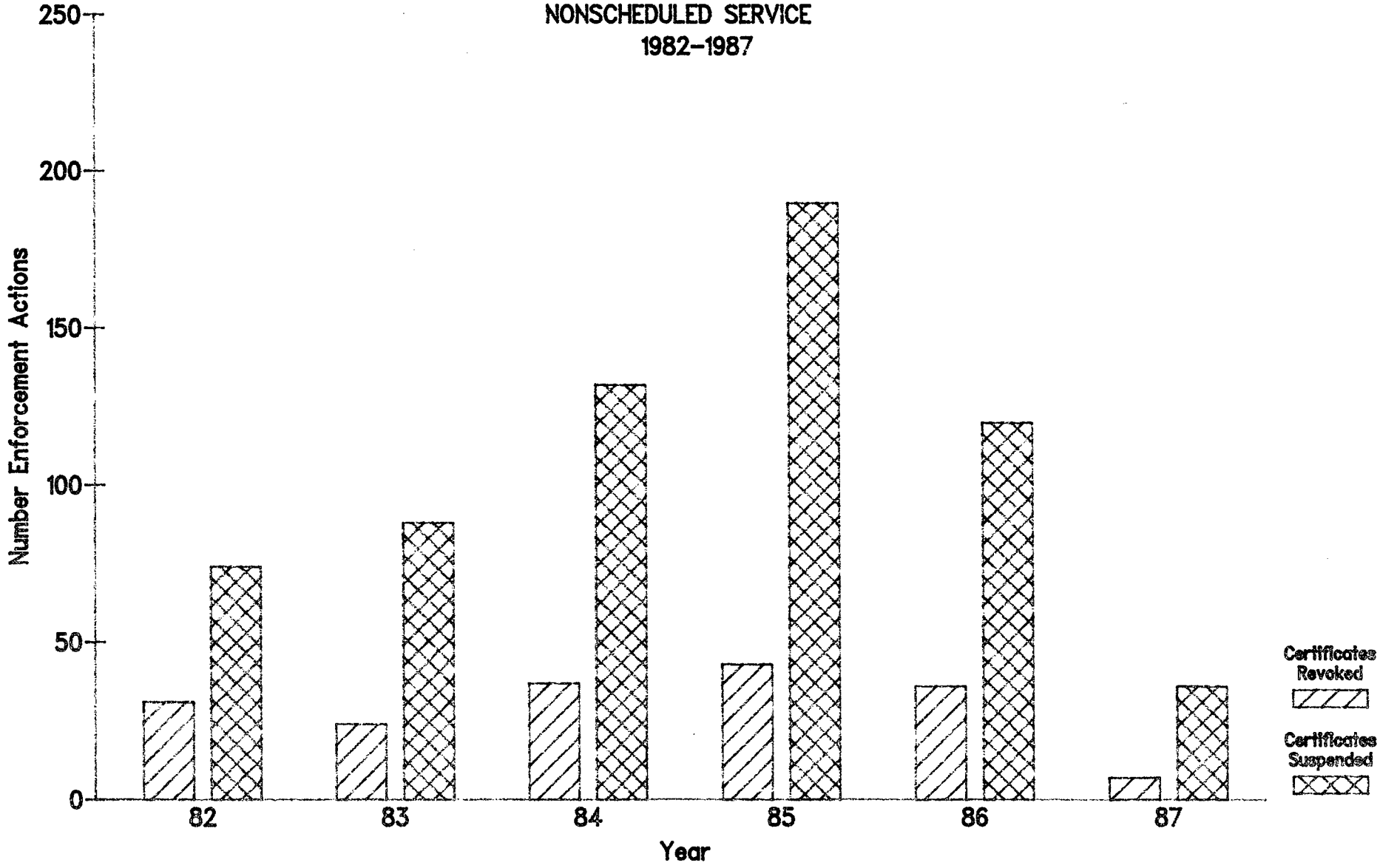
Data as of 1-22-88 are preliminary.

FIGURE 3-34
RATE OF ENFORCEMENT CASES INITIATED
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1982-1987



See Appendix A, Table 7 Data as of 1-22-88 are preliminary. Note: All rates are per 100,000 flight hours.

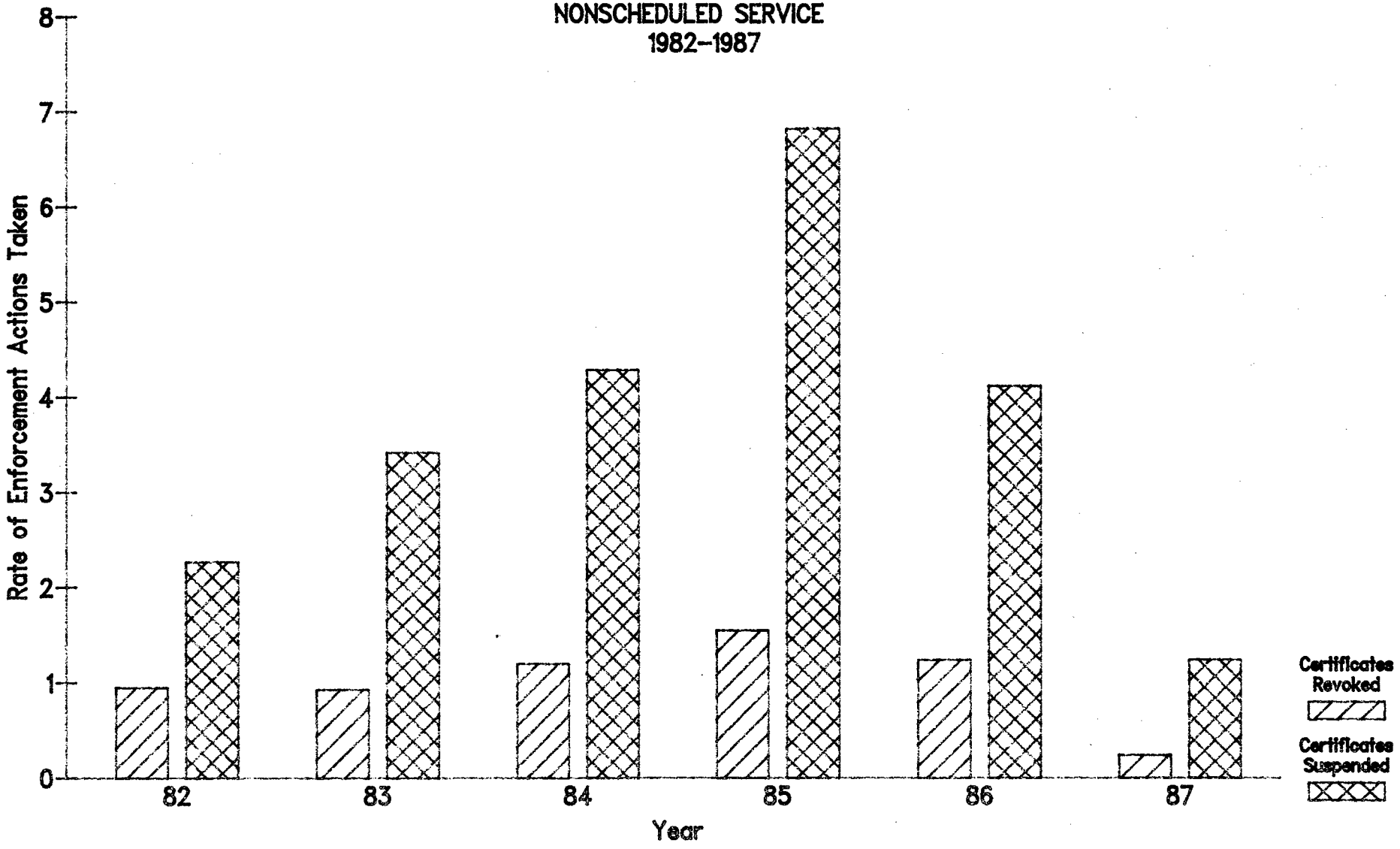
FIGURE 3-35
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF INITIATION
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1982-1987



See Appendix A, Table 7

Data as of 1-22-88 are preliminary.

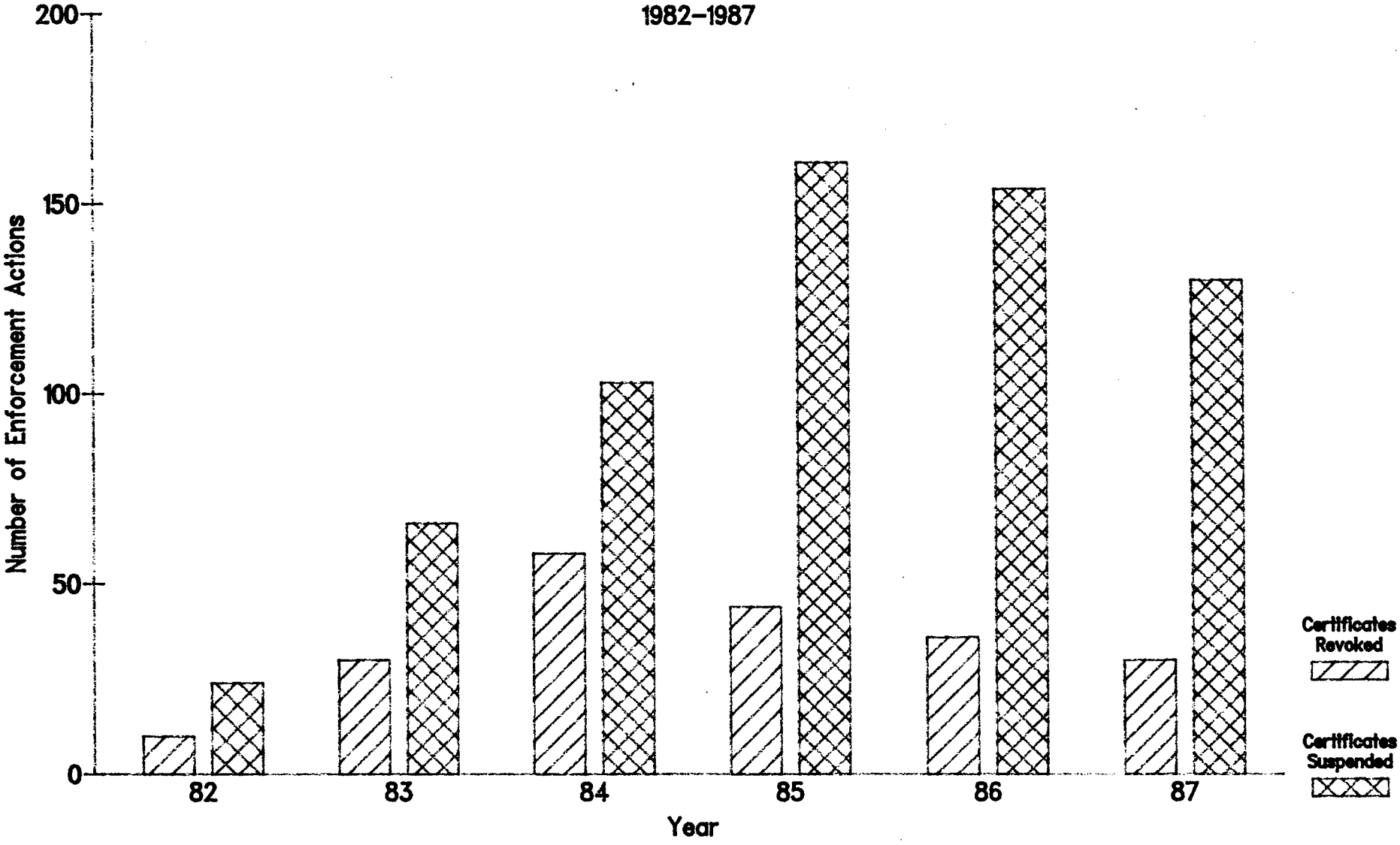
FIGURE 3-36
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF INITIATION
Per 100,000 Aircraft Flight Hours
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1982-1987



See Appendix A, Table 7

Data as of 1-22-88 are preliminary.

FIGURE 3-37
DISPOSITION OF ENFORCEMENT CASES BY YEAR OF COMPLETION
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1982-1987



See Appendix A, Table 7

Data as of 1-22-88 are preliminary.

4.0 LEVELS OF SURVEILLANCE AND STAFFING

4.1 INTRODUCTION

Sections 107 (b) and (c) of the Airline Deregulation Act require annual recommendations from the Secretary of Transportation on the level of surveillance necessary to enforce air safety regulations and the level of staffing necessary to carry out this surveillance. It also requires an analysis of the FAA's current and anticipated FAA personnel requirements with respect to enforcement of air safety regulations. This chapter reviews initiatives undertaken during 1987 to respond to the dynamic changes in the aviation industry brought about by deregulation and provides an analysis of current and anticipated FAA personnel requirements.

4.2 BACKGROUND: DOT/FAA SAFETY REVIEWS

Since 1984 there have been two internal reviews of FAA programs as well as two intensive inspections of the industry. The Secretary's Safety Review Task Force reviewed FAA's safety procedures and requirements and identified areas where improvements were needed. The Task Force report was issued in August 1985. In addition to the Safety Review Task Force, FAA conducted the following safety reviews: the National Air Transportation Inspection (NATI), which reviewed the safety condition of all U.S. air carriers and concluded in June 1984; the Safety Activity Functional Evaluation (Project SAFE), which looked at the FAA inspection process and was issued in November 1985; and the General Aviation Safety Audit (GASA), which evaluated the general and commercial aviation industry. The GASA review of on-demand air taxi operators was completed in December 1985. The National Aviation Safety Inspection Program (NASIP), which is a follow-on program to GASA and NATI, has examined individual air carrier practices with in-depth inspections of all aspects of operations.

Each of these reviews found safety conditions to be good, but identified some elements needing improvement. The Safety Task Force recommended that FAA improve the timeliness of its actions, the uniformity of the interpretation of its rules in various regions, its internal and external communications, and the management links between headquarters and the regional offices. The NATI found about 5 percent of the carriers not in compliance. Corrective actions were taken and the problems discovered in the inspection system led to immediate changes. Project SAFE supported the need to increase the inspector work force. The GASA found that on-demand air taxi operators showed an 89% compliance rate with Federal regulations.

Where improvements were needed, FAA acted quickly to correct the problems, including the initiation of a number of enforcement actions.

4.3 SAFETY ACTIVITY FUNCTIONAL EVALUATION (PROJECT SAFE)

In conjunction with the Secretary's Safety Review Task Force and the NATI program, the FAA initiated new efforts in 1987 in continuing support of Project SAFE. Project SAFE was undertaken to determine how well the FAA met the challenges of the changing aviation environment. The review included all parts of the Flight Standards System, which certifies and regulates the air carriers and private and business pilots who fly in the National Airspace System, and the equipment they use. Elements of the Flight Standards System that received critical appraisal included inspector tasks and work functions, and the overall management of the field inspector work force. Project SAFE has shown that since deregulation the environment of the aviation industry has changed dramatically, creating the need for the FAA to improve the Flight Standards System. Project SAFE confirmed the FAA's and the industry's outstanding safety record but also identified areas where problems exist and improvements could be made.

The initial findings for Project SAFE were:

1. Flight Standards System field and headquarters staff should be increased. Field staffing has been deficient for several years. Additional headquarters staff is needed to guide and to evaluate field activities and promote standardization through updating regulations and handbooks.

2. Flight Standards System needs an effective evaluation program. The interdependency of all functional elements of the Flight Standards System at all management and field levels is critical. Each of the key elements of the system must be capable of being updated on a continuous, real-time basis. Training programs supported by standardized written guidance based on a job task analysis and automated recordkeeping must be built into a management system that is responsive to changes in the operating environment. An assessment of the industry, based on actual inspection data, should be part of the evaluation program, thereby allowing changes in the industry to be integrated into FAA training and inspection programs.

3. Updating applicable Federal Aviation Regulations should receive priority. Expedited action should be taken to

adopt regulations that address the current environment and to rescind obsolete regulations.

4. Field staff need standardized guidance on a timely basis. This guidance should facilitate uniformity in inspection practices and interpretations of regulations.

5. The automated Aviation Safety Analysis System (ASAS) initiated by the FAA to manage safety and inspection data, can increase the productivity of field personnel. Automated systems can provide a real-time national data base effectively eliminating the existing problem of inter- regional data sharing. ASAS can also provide field personnel with operator inspection and enforcement histories without regard to geographical or FAA administrative boundaries, and allow management at all levels to evaluate partial or total program effectiveness and industry safety.

6. Personnel management and training programs should be revised to provide sufficient numbers of highly qualified and trained inspectors to accomplish the Flight Standards mission. The numbers of inspectors and support staff should be predicated on the size and scope of the workload. Applicants for inspector positions should be selected, hired, and trained based on work program needs and their entry level experience.

7. Attention to problems identified by Project SAFE requires strong management oversight to ensure that corrective action occurs within a time frame that is compatible with the total program.

<u>FAA has corrected many of the deficiencies identified by Project SAFE. Actions completed in 1987 include:</u>

1. Developed fifty standardized position descriptions and associated performance standards for various field office Aviation Safety Inspector positions.

2. Conducted a survey of position classification weighting factors. Results of the survey will be used to modify the DOT approved classification guide for Aviation Safety Inspector positions.

3. Completed the development of new criteria for qualification and disqualification of applicants for Aviation Safety Inspector positions.

4. Distributed for field office use, a new "how to" interview guide to improve the applicant screening process.

5. Through the Office of Personnel Management, and the Allen Corporation, completed learning objectives and testing requirements for training modules on several communications topics.

6. Drafted an initial 5-year training plan for Flight Standards.

7. Released for comment to FAA regions' field offices and industry the first portions of three new Flight Standards handbooks containing guidance for Aviation Safety Inspectors.

8. BETA tested new systems for automated vital information and operations specifications data systems.

9. Completed and published an agency order to redesign the system to assign data entry location codes for aviation standards field offices to use in computerized automation systems.

10. Published FY 1988 revised national work program guidelines, updating work definitions to use standard Job Task Analysis (JTA) terminology and related Work Program Management System codes.

11. Implemented an electronic mail system connecting Flight Standards with the 9 regional offices.

12. Published an order establishing the Flight Standards evaluation program, completed training the staff for the evaluation office and conducted evaluations in 2 regions.

13. Completed all scheduled FY 1987 National Aviation Safety Inspection Program (NASIP) inspections, and established the FY 1988 schedule. An additional seven special inspections were completed on FAR Part 121 air carriers.

14. Distributed a video tape to provide for a continuing awareness program on Project SAFE for all Flight Standards personnel.

In addition to measures that the agency has already implemented, FAA plans to act on other short- and long-term recommendations resulting from Project SAFE. These include:

1. Continue the functional analysis of clerical, administrative, regional staff specialist, and aircraft evaluation group positions.

2. Continue a contractual effort to develop a human resource management manual to use in automating and standardizing various career progression, training requirements identification, and other human resource management activities in the management of Flight Standards District Offices.

3. Implement work on a new OPM qualification standard and recruiting announcement for Aviation Safety Inspector positions.

4. Continue development of other improvements to the inspector screening process; that is, implementation of a Communications Effectiveness Test and pre-retention evaluation criteria.

5. Complete collection of staffing standard environmental and activity data for use in projecting Aviation Safety Inspector staffing requirements.

6. Release contractor-developed course modules and learning objectives at an increased rate during the year.

7. Complete the development of the initial Flight Standards 5-year training plan.

8. Release additional handbook material for comment by FAA and industry personnel and publish in final form material coordinated during 1987.

9. Implement vital information data bases and automated operations specifications systems.

10. Continue conversion of the Aviation Safety Analysis System (ASAS) and Work Program Management System (WPMS) to IBM compatible systems for use in the Office of Flight Standards, 9 regional and 90 field offices.

11. Conduct evaluations in regional offices in accordance with published schedules.

12. Continue National Aviation Safety Inspection Program (NASIP) inspections to meet established schedules and publish an agency directive to implement inspection protocols on a permanent basis.

13. Complete a human resource management transition plan for inclusion in the Human Resource Management handbook.

The automated Project SAFE Implementation Plan is operational and updates project accomplishments on a quarterly basis. This information is used in FAA's periodic reports to Congress about Project SAFE program performance and new project initiatives.

4.4 NATIONAL AVIATION SAFETY INSPECTION PROGRAM (NASIP)

The National Aviation Safety Inspection Program (NASIP), was initiated in 1986 at the direction of the Administrator. This program was devised to provide increased depth using the inspection expertise from FAA regions in addition to the region that holds the operating and maintenance certificate. Standardization of procedures and increased compliance with the FARs has resulted. The program consists of comprehensive inspections of air carriers, commuters and other air agencies and has uncovered some major noncompliance situations that were not previously discovered during routine surveillance. These more "in-depth" inspections have supplemented the routine inspections of resident inspectors whose activities are more limited in scope, and performed on a routine basis. The inspections are conducted by teams of inspectors normally drawn from outside the FAA region in which the certificate is held. This inter-regional utilization of inspectors helps promote standardization of inspection activities through application of national NASIP guidelines. In 1987, a number of potential and actual safety-related deficiencies were identified, and appropriate action initiated.

The FAA plan is to schedule major air carriers for NASIP inspections on a recurring basis. This continued examination of the aviation industry will focus on any need for more frequent inspections systemwide to promote increased levels of compliance.

The level of NASIP inspections follows:

In FY-86, 18 FAR Part 121 air carriers and 20 FAR Part 145 repair stations were inspected.

In FY-87, 15 FAR Part 121 air carriers, 3 FAR Part 135

scheduled commuter air carriers, 14 FAR Part 141 pilot schools, and 7 FAR Part 145 repair stations were inspected.

In FY-88, it is expected that 9 FAR Part 121 air carriers, 6 FAR Part 135 scheduled commuter air carriers, 4 FAR Part 135 helicopter emergency medical service operators, 2 FAR Part 133 rotorcraft external load operators, 12 FAR Part 141 pilot schools, 9 FAR Part 145 repair stations, and 2 FAR Part 147 aviation maintenance technician school inspections are will be completed.

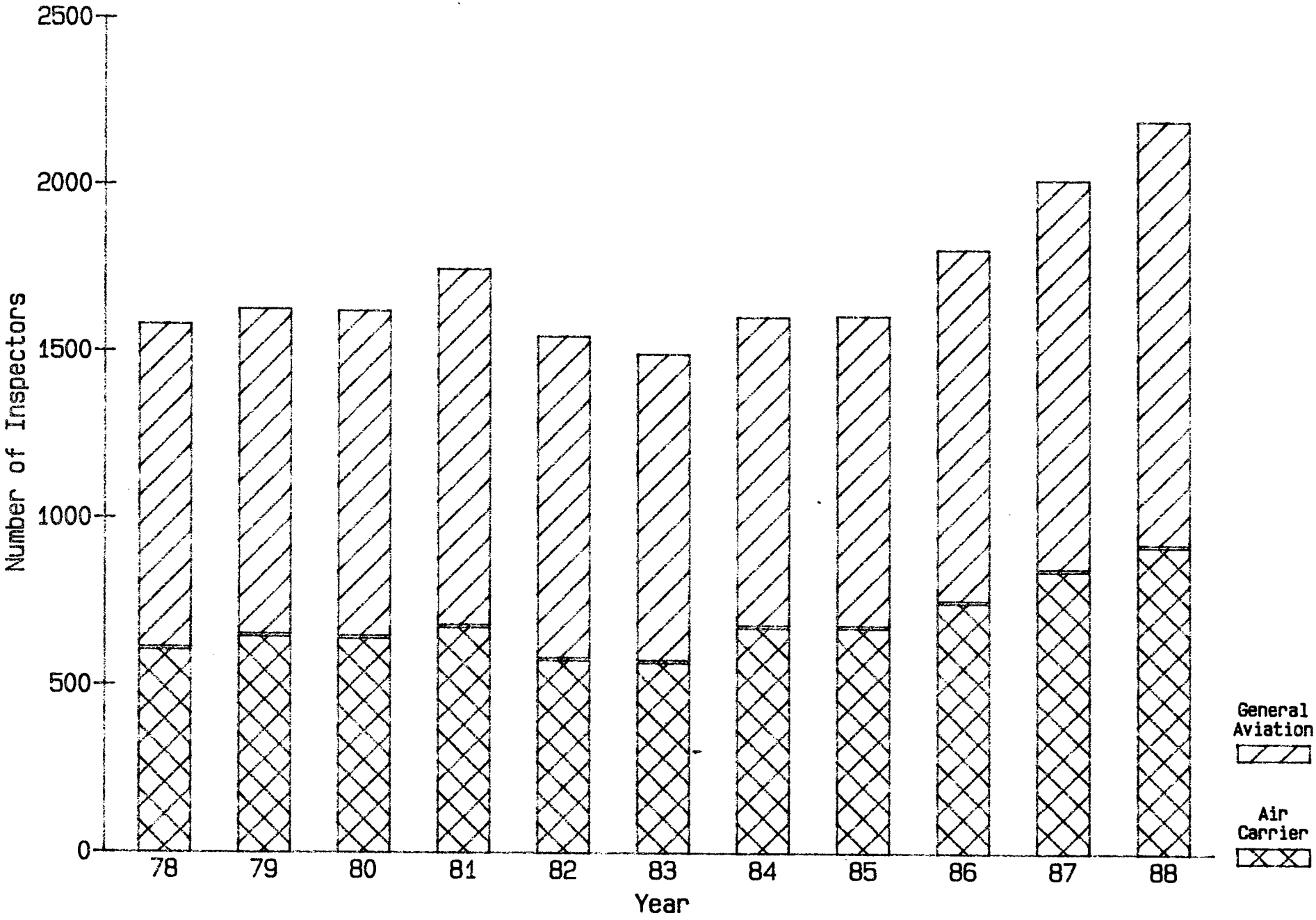
4.5 RECOMMENDATIONS FOR FUTURE STAFFING

Actions were taken by the FAA in 1987 in response to the Project SAFE recommendations. Additional staffing and training needs, defined in Project SAFE, will be continuously reviewed and revised, as needed, in direct response to industry changes in the deregulated environment. The rapidly growing and changing air transportation industry has dramatically increased the demands upon FAA's inspector work force.

Reviews of actual field office inspector position levels in prior years showed only a 2% increase between January 1978 and January 1985. In 1985 the authorized staffing level of air carrier inspectors was 674, an 11% increase over the 1978 level. Since reaching a low of 1,494 total authorized inspectors in 1983, the authorization level has steadily increased by more than 47% over the subsequent five years. The inspector position level for 1988 of 2,198 is the highest level in the ten years since deregulation. Figure 4-1 shows the historical levels of authorized inspectors from 1978 to the present.

The FAA also initiated an effort to assure, on a continuing basis, that inspector levels remain consistent with anticipated workload requirements. A new staffing standard was developed which will accurately match workload with staffing needs. The standards were applied in the development of the FY 1988 budget request and will be further refined in future budgets to assure that new personnel requirements are identified as industry environmental conditions change. Congress has authorized FAA an advance of 72 positions for fiscal year 1987. As a result of both this congressional authorization and the

Figure 4-1
Authorized Inspector Staffing Levels
1978 – 1988



newly developed staffing standard, an additional 178 inspector positions have been requested in the FY 1988 budget, with additional positions to be requested in subsequent years. The proposed future incremental personnel additions are as follows:

Fiscal Year	Inspector	Support	Total
FY-87	72	-	72
FY-88	178	50	228
FY-89	300	100	400
FY-90	300	100	400
FY-91	250	102	352
Total	1100	352	1452

4.6 RECOMMENDATIONS FOR FUTURE INSPECTION AND CERTIFICATION

The major emphasis in 1988 will be on the initiatives begun in 1987, the further implementation of national programs in accordance with Project SAFE, and the standardization of recommended actions identified during the NATI and GASA inspections. The FAA will upgrade criteria and procedures for hiring new inspectors and will, in addition, update inspector training courses and programs to ensure adequate formal inspector training. Inspector handbooks will be revised, standardized, and distributed to inspectors on a timely basis so that inspection and certification activity can be guided efficiently and accurately. Data gathered during inspections and from other sources will be monitored in order to detect emerging problems and to refocus attention toward indicated problem areas. Aviation industry changes in the deregulated aviation environment will be closely monitored and forecasted in order to anticipate their impact on FAA programs and to ensure that regulations reflect those changes. In addition, the NASIP will ensure continuing examination of specific air carriers with indepth inspections. These actions will help FAA keep pace with a rapidly changing aviation industry and continue to provide a safe and efficient air transportation system.

5.0 ADEQUACY OF AIR SAFETY REGULATIONS

5.1 INTRODUCTION

Section 107 of the Airline Deregulation Act requires an analysis of the effect of changes in air carrier operating practices in 1987 on current levels of air safety and on the adequacy of the air safety regulations to meet these changes.

During 1987, the FAA continued an intensive review of air carrier safety practices and collected additional information on the cumulative operational changes which have taken place in commercial aviation since the enactment of deregulation. Also, The Administrator's IMPACT 88 Program, emphasized the need for additional regulatory development and action in the specific areas of aircrew performance and airspace capacity. Pertinent regulations proposed and promulgated in 1987 and their impact on aviation safety are discussed in Sections 5.2 and 5.3.

5.2 PERTINENT REGULATIONS, ADVISORIES, AND ORDERS ISSUED IN 1987

5.2.1 Air Traffic Control Radar Beacon System (ATCRBS) and Mode S Transponder Requirements in the National Airspace System

This action sets forth requirements pertaining to the use, installation, inspection, and testing of ATCRBS and Mode S transponders in U.S.-registered civil aircraft. It requires as of December 1, 1987, a transponder and automatic altitude reporting equipment for flight within Group II Terminal Control Areas. The rule provides for a phased transition from ATCRBS to Mode S transponders in the National Airspace System by requiring any transponder installed after January 1, 1992, to be a Mode S transponder. It also allows transponders installed prior to that date to be used indefinitely.

5.2.2 Airworthiness Standards and Operating Rules: Commuter Category Airplanes

These amendments issued on January 8, 1987, adopt certification procedures, airworthiness and noise standards, and operating rules for an additional category of propeller-driven, multi-engine airplane, designated as the Commuter Category. The amendment to Part 21 allows certification of commuter category airplanes by the same procedures applicable to other aircraft. The amendment to Part 23 adds airworthiness standards for airplanes with a maximum seating capacity, excluding pilot seats, of 19 or less and a maximum certificated takeoff weight of

19,000 pounds or less and requires type certification compliance with the International Civil Aviation Organization (ICAO) Annex 8, Part III, requirements which apply to airplanes weighing in excess of 5,700 kilograms (12,566 pounds). The amendment to Part 36 adopts noise standards applicable to small, propeller-driven airplanes to be certificated in the commuter category. Parts 91 and 135 are amended to prescribe rules governing the operation of commuter category airplanes as required by the general operating and flight rules.

Since 1966, the FAA has been applying various additional airworthiness requirements to the certification of small airplanes intended for use in air taxi operations, to achieve an acceptable level of safety when the affected airplanes are so utilized. These additional requirements were set forth in special conditions, Special Federal Aviation Regulations (SFAR) 23, Part 135 Appendix A, and SFAR 41. The SFAR were temporary rules intended only to provide relief to the industry and public from the lack of suitable certification procedures and standards while the FAA developed permanent rules. SFAR 23 ceased to be applicable after July 19, 1970, and SFAR 41 expired on September 13, 1983. The final rule, which includes the new commuter category, will set forth airworthiness requirements in Part 23 for airplanes intended for use in commercial operations. As a result of this action, airplanes certificated in the commuter category will achieve a level of safety requisite for commercial operations.

5.2.3 Flight Recorders and Cockpit Voice Recorders

These amendments, issued on March 18, 1987, require improved (digital) flight recorders with additional data parameters for airplanes type certificated before 1969 and operated in Part 121 operations. Review of National Transportation Safety Board accident/incident files for January 1983 to February 1986 revealed the high failure rate of the metal foil flight recorders. The data revealed that 37 recorders (48 percent) had one or more malfunctioning parameters preceding the accident/incident preventing the recording or readout of pertinent data. As a result, post-accident flight recorder examination cannot be relied on to provide accident investigators with sufficient information to assess accurately the causal interrelationship between man, machine, and environment. The requirement of a digital flight recorder with additional data parameters is deemed the minimum standard necessary to ensure that all of the underlying causal factors of an accident are identified. The amendments also require cockpit voice recorders on newly manufactured multi-engine, turbine-powered airplanes certificated to carry six or more passengers, requiring two

pilots by type certification or operating rules for those operations conducted under Part 135. The amendments also specify that for those operators conducting operations under Part 91 and Part 125 that have installed approved cockpit voice recorders, the Administrator will not use the record in any civil penalty or certificate action.

5.2.4 Protective Breathing Equipment

This amendment, issued on May 26, 1987, became effective July 6. The compliance date is July 6, 1989. This final rule amends the regulations applicable to protective breathing equipment (PBE) by: (1) incorporating the requirements of Section 25.19 of the Federal Aviation Regulations (FAR) into current Section 121.337; (2) providing new standards for PBE for crewmembers who may be required to fight in-flight fires; (3) requiring the performance of an approved firefighting drill using PBE; (4) requiring that, when possible, additional PBE be located within 3 feet of each required hand fire extinguisher in passenger compartments; and (5) clarifying certain emergency drill requirements.

5.2.5 Carry-On Baggage Program

This amendment, issued on May 26, 1987, became effective July 6. The compliance date was January 1, 1988. This rule requires Part 121 air carriers to develop and use approved carry-on baggage programs. The rule also requires air carriers to verify that each article of baggage is properly stowed before the last cabin door is closed prior to pushback or taxi. This rule will enhance safety by controlling the amounts and size of carry-on baggage and ensuring that all such baggage is safely stowed.

5.2.6 Airport Certification

This amendment issued on November 18, 1987, revised the airport certification regulations to improve compliance with and enforcement of safety standards. The changes affect such areas as aircraft fueling, firefighting and rescue equipment, and snow and ice control. Under the revised regulations, individual airport operators will retain responsibility for the overall safety of fueling operations by setting standards for airport tenant organizations and conducting periodic inspections to insure compliance; however, airport tenants will now assume responsibility for quality control of aircraft fueling activities. In the area of aircraft firefighting and rescue vehicles, FAA will continue to set minimum standards for all commercial airports. This amendment mandates a full scale demonstration of an airport emergency plan every 3 years

and, for the first time, requires airport operators in snow belts to have a written snow and ice control plan.

5.3 PERTINENT RULEMAKING, PROGRAMS, AND PLANS IN PROCESS IN 1987

5.3.1 Low Fuel Quantity Alerting System

This notice proposes to amend the airworthiness standards for transport category airplanes by requiring a means to alert the flightcrew of potentially unsafe low fuel quantities. There have been several recent fuel depletion incidents involving loss of power or thrust on all engines that could have resulted in forced landings and injury or loss of life. Most of these incidents resulted from improper fuel management techniques. This proposal would require new transport category airplane designs to incorporate a low fuel quantity alert to the flightcrew that would allow either correction of certain fuel management errors or the opportunity to make a safe landing prior to engine fuel starvation.

5.3.2 Airborne Low-Altitude Wind Shear Equipment and Training Requirements

The National Transportation Safety Board has determined that low-altitude wind shear has been a prime causal factor in numerous air carrier accidents. These proposed rulemakings, if adopted, should reduce wind shear related accidents by enhancing pilot understanding of wind shear and by requiring certificate holders to develop and use procedures and flight guidance equipment to facilitate escape from inadvertent hazardous wind shear encounters. This Notice of Proposed Rulemaking (NPRM) discusses the various aspects which might have a bearing on possible low-altitude wind shear solutions. It also proposes to require that certain turbine-powered airplanes operated in accordance with Part 121 have airborne systems that warn a pilot of the presence of hazardous low-altitude wind shear conditions and if such wind shear conditions are inadvertently encountered, provide flight guidance for a missed approach procedure or an escape maneuver. In addition, the notice proposes that all Part 121 operators conduct approved low-altitude wind shear flight training in an approved simulator. The NPRM further proposes that the training programs of Part 121 and 135 certificate holders include training concerning flight crewmember recognition and escape from low-altitude wind shear conditions as part of the normal ground training.

5.3.3 Traffic Alert and Collision Avoidance System (TCAS)

This notice proposes to require the installation and use of a Traffic Alert and Collision Avoidance System (TCAS) in large transport type airplanes and certain turbine-powered smaller airplanes. TCAS, which utilizes the signal from existing transponders, would provide for a collision avoidance capability in the cockpit independent of the ground air traffic control (ATC) system, or where there is no ATC coverage. Additionally, the notice proposes that all operators of TCAS-equipped airplanes have an FAA-approved TCAS training program for flight crewmembers.

5.3.4 Location of Passenger Emergency Exits in Transport Category Airplanes

This notice proposes to limit increases in passenger emergency escape path distance by establishing a new standard limiting the distance any passenger seat may be from the nearest emergency exit and the distance any exit may be from an adjacent exit. The proposal would make the standard applicable to type certification of new transport category airplane models, regardless of the date of original application for type certificate, and to airplanes operating under Part 121 except those already in operation. The standard would be applicable for issuance of standard airworthiness certificates for airplanes manufactured after a specified date. The proposal is a result of the Emergency Evacuation Task Force and is intended to improve the likelihood of passengers safely escaping an airplane during an emergency evacuation.

5.3.5 Fire Protection Requirements for Cargo or Baggage Compartments

This notice proposes to upgrade the fire safety standards for cargo or baggage compartments in certain transport category airplanes used in air carrier, air taxi, or commercial service. Ceiling and sidewall liner panels that are not constructed of aluminum or rigid fiberglass and are used in Class C or D compartments greater than 200 cubic feet would have to be replaced with improved panels prior to a specified date. This notice is the result of research and fire testing and is intended to increase airplane fire safety.

5.3.6 Expanded East Coast Plan

The Expanded East Coast Plan is a comprehensive revision of the air traffic control routes and procedures in the eastern United States. This plan involves the major restructuring of both airspace and the flow of air traffic and is designed

to relieve saturation and compression. Phase I of the Plan was completed on February 12, 1987, and resulted in a significant reduction of delays in the New York metropolitan area. Phase II was completed on March 10, 1988, with the alteration or establishment of 33 jet routes and 51 airways as well as major changes in airspace and air traffic flows. Phase II completed the Plan and should increase system efficiency and safety, while further reducing air traffic delays along the East Coast.

5.3.7 Grand Canyon National Park Special Flight Rules Area

The FAA has established regulations for the flight of aircraft in the vicinity of the Grand Canyon National Park (Special Federal Aviation Regulations 50-1) from the surface to 9,000 feet mean sea level effective April 27, 1987. These regulations are in effect until June 15, 1992. Under these regulations flight is prohibited in special flight rules areas unless specifically authorized by the FAA Flight Standards District Office. The FAA is now in the process of developing a notice of proposed rulemaking, based on the Department of the Interior's recommendation, to establish permanent flight-free areas in the vicinity of the Grand Canyon Park.

5.3.8 Airport Radar Service (ARSA) Program

Airport Radar Service Areas are standard-sized airspace designations within which pilots are provided the same air traffic control services appropriate to their instrument or visual flight rules (IFR/VFR) operations. ARSA services are provided within the 10-nautical-mile regulatory and 10- to 20-nautical-mile nonregulatory rings of the primary airport of the ARSA. These services include sequencing to the primary airport, traffic advisories, safety alerts, and separation of the aircraft appropriate to the IFR/VFR flight being conducted. Ninety-eight ARSA's were operational as of January 14, 1988, and we anticipate that an additional 27 will be added through the remainder of calendar year 1988.

TABLE 1

ACCIDENT AND INCIDENT STATISTICS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
SCHEDULED SERVICE
1978 - 1987

Accidents			Fatal Accidents		Fatalities		Incidents *	
Year	#	Rate	#	Rate	#	Rate	#	Rate
1978	20	.332	5	.083	160	2.65	994	16.48
1979	23	.343	4	.060	351	5.23	1,050	15.64
1980	15	.221	0	0	0	0	1,053	15.49
1981	25	.380	4	.061	4	.06	634	9.65
1982	15	.233	3	.047	233	3.62	433	6.72
1983	22	.331	4	.060	15	.23	402	6.05
1984	12	.161	1	.013	4	.05	429	5.77
1985	17	.214	4	.050	197	2.48	670	8.43
1986	20	.214	1	.011	1	.01	824	8.81
1987	31	.309	4	.041	231	2.38	681	7.01

* Includes incidents involving nonscheduled U.S. Air Carriers operating under 14 CFR 121.

Notes: Includes accidents involving deregulated all-cargo carriers and commercial operators of large aircraft when these accidents occurred during scheduled 14 CFR 121 operations.
The one suicide/sabotage accident in 1987, resulting in 43 fatalities is excluded from the total accident, fatal accident and fatality rates.

All rates are per 100,000 flight hours.

Sources: Incident data compiled from AIDS database as of 1-13-88.
Accident data compiled from NTSB news release dated 1-12-88.

TABLE 2

ENFORCEMENT INFORMATION STATISTICS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
SCHEDULED AND NONSCHEDULED SERVICE
1982 - 1987

YEAR	Enforcement Cases by Year of Initiation		Cases Resulting in Revocation		Cases Resulting in Suspension		Enforcement Actions * Completed in Year	
	#	Rate	#	Rate	#	Rate	Revocations	Suspensions
1982	1429	21.32	5	.07	98	1.46	2	21
1983	1656	23.89	6	.09	133	1.92	6	119
1984	1906	24.55	21	.27	136	1.75	14	119
1985	2452	29.52	22	.26	147	1.77	14	139
1986	3839	39.47	13	.13	181	1.86	21	169
1987	3266	32.19	3	.03	41	.40	12	168

Data as of 1-22-88 are preliminary.

Note: All rates are per 100,000 flight hours.

* The number of enforcement actions completed in a given year can include completion of cases initiated in prior years.

TABLE 3

ACCIDENT STATISTICS
U.S. AIR CARRIERS OPERATING UNDER 14 CFR 121
NONSCHEDULED SERVICE
1978 - 1987

Accidents			Fatal Accidents		Fatalities	
Year	#	Rate	#	Rate	#	Rate
1978	2	.99	0	.00	0	.00
1979	6	3.62	1	.60	3	1.81
1980	4	1.48	1	.37	1	.37
1981	1	.42	0	.00	0	.00
1982	4	1.53	1	.38	1	.38
1983	2	.71	0	.00	0	.00
1984	4	1.23	0	.00	0	.00
1985	5	1.41	3	.84	329	92.47
1986	2	.55	1	.27	3	.82
1987	5	1.14	1	.23	1	.23

Note: All rates are per 100,000 flight hours.

Sources: Incident data compiled from AIDS database as of 1-12-88.

TABLE 4

ACCIDENT AND INCIDENT STATISTICS
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1978 - 1987

Accidents			Fatal Accidents		Fatalities		Incidents *	
Year	#	Rate	#	Rate	#	Rate	#	Rate
1978	61	4.68	14	1.08	48	3.69	131	10.06
1979	52	4.44	15	1.28	66	5.64	220	18.80
1980	38	3.23	8	.68	37	3.15	196	16.67
1981	31	2.50	9	.73	34	2.74	222	17.89
1982	26	2.00	5	.38	14	1.08	145	11.16
1983	18	1.19	2	.13	11	.73	118	7.81
1984	22	1.26	7	.40	48	2.75	166	9.51
1985	21	1.21	7	.40	37	2.13	200	11.51
1986	15	1.06	2	.14	4	.28	224	15.88
1987	35	2.39	10	.68	58	3.97	212	14.50

Note: All rates are per 100,000 flight hours.

Sources Incident data compiled from AIDS database as of 1-13-88.
Accident data compiled from NTSB news release dated 1-12-88.

TABLE 5

ENFORCEMENT INFORMATION STATISTICS
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1982 - 1987

YEAR	Enforcement Cases by Year of Initiation		Cases Resulting in Revocation		Cases Resulting in Suspension		Enforcement Actions * Completed in Year	
	#	Rate	#	Rate	#	Rate	Revocations	Suspensions
1982	348	26.77	5	.38	26	2.00	0	10
1983	307	20.33	7	.46	16	1.06	5	20
1984	580	33.14	14	.80	54	3.09	10	32
1985	533	30.63	14	.80	59	3.39	22	46
1986	431	30.57	6	.43	59	4.18	6	61
1987	486	33.29	0	.00	14	.96	3	57

Data as of 1-22-88 are preliminary.

Note: All rates are per 100,000 flight hours.

* The number of enforcement actions completed in a given year can include completion of cases initiated in prior years.

TABLE 6

ACCIDENT AND INCIDENT STATISTICS
U.S. COMMUTER AIR CARRIERS OPERATING UNDER 14 CFR 135
SCHEDULED SERVICE
1978 - 1987

Accidents			Fatal Accidents		Fatalities		Incidents *	
Year	#	Rate	#	Rate	#	Rate	#	Rate
1978	198	5.58	54	1.52	155	4.37	240	6.77
1979	160	4.34	30	.81	77	2.09	267	7.25
1980	171	4.73	46	1.27	105	2.9	241	6.66
1981	157	5.42	40	1.38	94	3.25	266	9.19
1982	132	4.05	31	.95	72	2.21	194	5.96
1983	140	5.44	27	1.05	62	2.41	211	8.19
1984	146	4.74	23	.75	52	1.69	247	8.02
1985	152	5.46	35	1.26	76	2.73	316	11.36
1986	117	4.02	32	1.10	67	2.30	396	13.59
1987	98	3.38	31	1.07	68	2.34	320	11.03

Note: All rates are per 100,000 flight hours.

Sources Incident data compiled from AIDS data base as of 1-13-88.
Accident data compiled from NTSB news release dated 1-12-88.

TABLE 7

ENFORCEMENT INFORMATION STATISTICS
U.S. ON-DEMAND AIR TAXIS OPERATING UNDER 14 CFR 135
NONSCHEDULED SERVICE
1982 - 1987

YEAR	Enforcement Cases by Year of Initiation		Cases Resulting in Revocation		Cases Resulting in Suspension		Enforcement Actions * Completed in Year	
	#	Rate	#	Rate	#	Rate	Revocations	Suspensions
1982	879	26.99	31	.95	74	2.27	10	24
1983	891	34.60	24	.93	88	3.42	30	66
1984	953	30.95	37	1.20	132	4.29	58	103
1985	1290	46.36	43	1.55	190	6.83	44	161
1986	1066	36.59	36	1.24	120	4.12	36	154
1987	1047	36.10	7	.24	36	1.24	30	130

Data as of 1-22-88 are preliminary.

Note: All rates are per 100,000 flight hours.

* The number of enforcement actions completed in a given year can include completion of cases initiated in prior years.